

THE IRON AGE

Published every Thursday Morning by David Williams Co., 14-16 Park Place, New York.

Vol. 84: No. 23. New York, Thursday, December 2, 1909.

\$5.00 a Year, including Postage.
Single Copies, 15 Cents.

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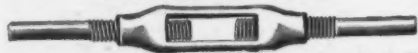
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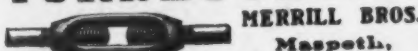
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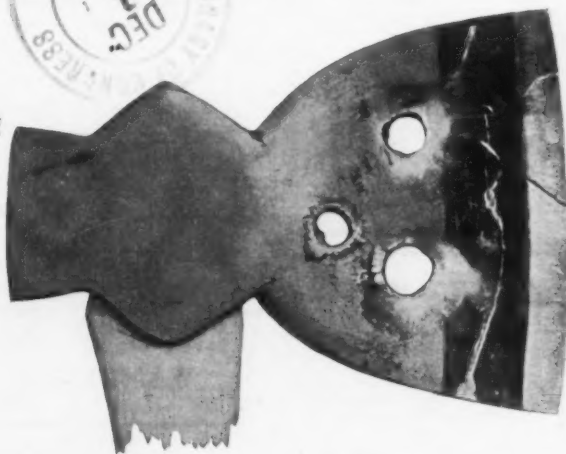
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SEE
PAGE 35



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49 CLIFF STREET

NEW YORK

THE IRON AGE

New York, Thursday, December 2, 1909.

The Leland High Speed Sensitive Drill.

The four-spindle high speed sensitive drill press shown in the illustrations contains several departures from generally accepted practice, and is especially interesting because it is the first of a new line built by W. H. Leland & Co., Worcester, Mass. It is a very heavy tool, with some 250 lb. more metal than is usual in its class, the builders believing that the work now required of a sensitive drill press necessitates very substantial construction taking into consideration the fact that the only sensitive parts are the feed by hand, and, when

mounted at the side of the spindle. Being of the screw type, no slip is possible. All horizontal bearings are ring oiling, made with inserted bushings of a special metal, following the practice which has been so thoroughly developed in automobile design. When desired, however, ball bearings are furnished. The vertical bearings have felt storage for oil. The shifting of the belt is accomplished by the treadles, located at both sides of the base.

The drill is designed to run at the highest speeds permissible with high speed steel drills.

Fig. 1 shows a front view of the machine, with details of the stop motion and table construction; Fig. 2

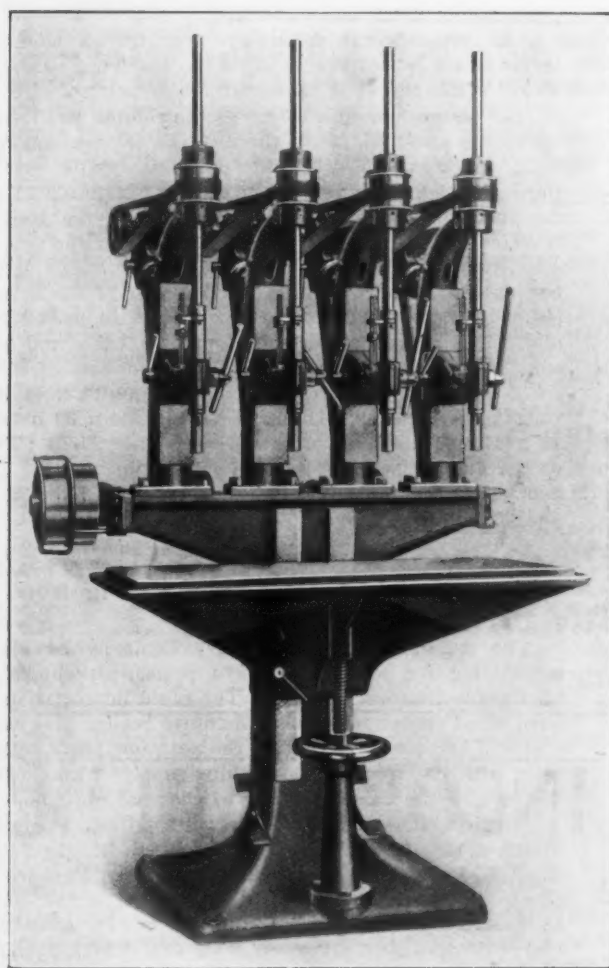


Fig. 1.

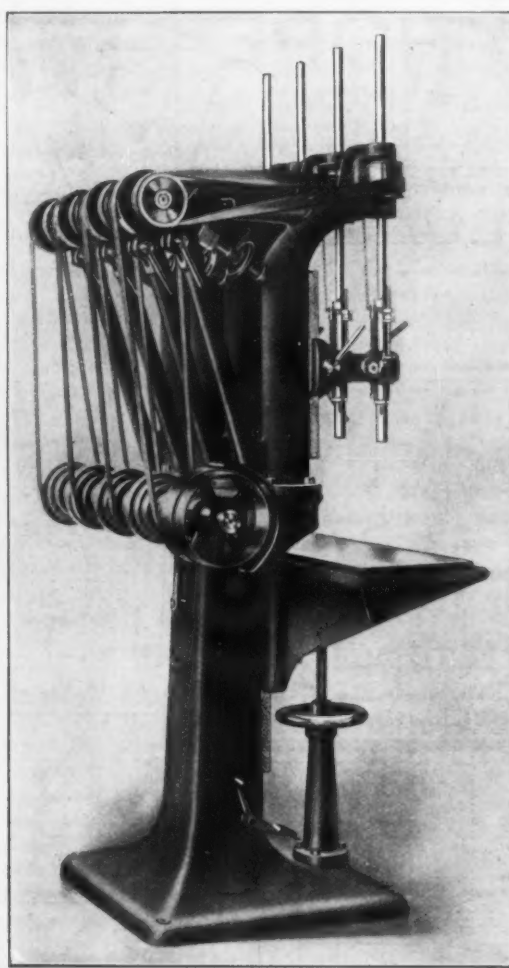


Fig. 2.

Two Views of a Four-Spindle Pattern of the New High Speed Sensitive Drill Built by W. H. Leland & Co., Worcester, Mass.

required, the drive by belt. The base is very heavy, of a box shape section throughout, up to the foot of the columns, for the purpose of maintaining under all circumstances the truth of the surface to which the heads are bolted. The ribbing of the table is another feature, the design being similar to that of surface plates. In this the effort has been made to insure maintaining the table level, so that even under the weight of the heaviest jib no springing of this part can take place.

Regarded mechanically, most attention will be attracted by the method of tightening the belts, which must always be an essential feature of this type of tool. The combination of a screw and swivel motion gives the desired position of the back shaft pulleys and at the same time equalizes the tension of the two belts, a detail which is treated more elaborately later. A unique feature of the feed is a ratchet device for the lever handle. The stop motion is furnished with micrometer readings if desired, and in both this and the standard form is

gives a general idea of the belt tightening mechanism, Fig. 3 details of it and Fig. 4 details of the table construction.

The construction of the gooseneck, together with the method of tightening the belts, constitutes an essential feature in the design of the machine. The parts *a* and *b*, Fig. 3, form with the gooseneck a triangular truss which stiffens the construction to overcome the strains when belts are tightened to high tension for large drills, and prevent spring in any part of the head. Each gooseneck has independent adjustment of belt tension and independent change of speeds. The box *c* of the back shaft *d* is clamped between two guiding surfaces at *e*. The screw *f* is a part of the box and works in the hand wheel nut *g*, the ball end of which rests in the socket *h*, in which it can swivel. Loosening the binder handle *i* releases the box and allows it and the back shaft to swivel about *h* in a vertical plane between the two guiding surfaces at *e*. The turning of the hand wheel nut moves

the back shaft in or out, loosening or tightening the belts. Thus when the binder clamp is loosened and the hand wheel nut turned, the inward or outward movement and the swiveling motion combine to equalize the tension of the two belts, so that they drive equally well. Tightening the binder fixes the back shaft in its new position and the lower belt can then be moved to either of its four positions for the different speeds.

Referring to the arrangement of belting, the belts *j* and *k* transmit the power from the lower shaft to the spindle. The latter belt makes a quarter turn and is driven from a pulley fixed on the shaft *d*, on the other

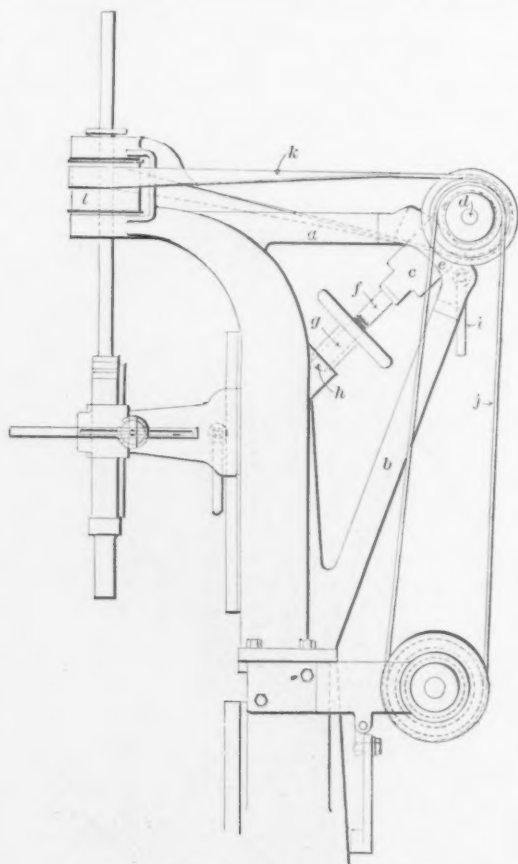


Fig. 3.—Details of the Belt-Tightening Mechanism.

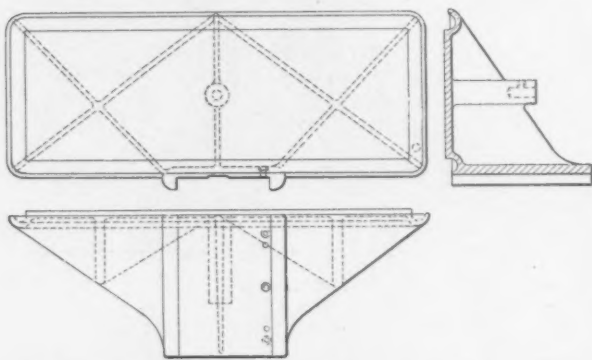


Fig. 4.—Details of the Table Construction of the Leland High Speed Sensitive Drill.

end of which is mounted a four-step cone pulley belted to a cone pulley on the lower shaft. The pulley *l* on the drill spindle is merely a drum, made more than twice the width of the $1\frac{1}{2}$ in. belt, so that the quarter turn belt may take its normal position as the back shaft is moved toward or away from the gooseneck. The upper bearing of the spindle is double, with one part above the pulley to procure the best conditions for the pull of the belt against the upper quill.

The head is held in any position on its face of the post by a binder. In fact binders are employed throughout the machine, there being no necessity to use a wrench in any adjustment or operation. The feed lever is of sufficient diameter and length to permit of a powerful feed for large drills. It can be moved quickly from

short to long leverage, being splined in its bearing for that purpose. The feed is through rack and pinion, in the usual way, and also through a ratchet, which is novel. A twist of the hand lever raises the pawl and holds it disengaged until released to engage a new tooth. The lever is knurled sufficiently to permit of a good grip.

The stop motion, mounted at the side of the spindle, consists of a screw and nut and a projecting piece from the spindle sleeve, together with a check nut and binder. The screw passes through a clearance hole in the projecting piece, and the motion of the spindle downward is stopped when the nut strikes the piece. In the ordinary equipment of the machine the screw is round, while two ordinary nuts are furnished, depths being set by scale or block. The machine is shown equipped with a micrometer gauge. The screw is slotted off on its front and graduated to tenths of an inch, while the nut is graduated to hundredths; each graduation therefore corresponds to 1-1000 in. traverse of the spindle. This arrangement is desirable in tool making and for other purposes where precision is required.

The table is raised and lowered by an elevating screw which is stationary, while the nut hand wheel revolves. The thrust is taken on a ball bearing.

The distance from the face of the column to the center of the spindle is 7 in., the distance between spindles 9 in., the maximum distance from the spindle nose to the table 24 in., the vertical adjustment of heads 11 in., the vertical adjustment of the table 12 in., the vertical traverse of the spindle 5 in., the diameter of the spindle 1 in., the diameter of the nose $1\frac{1}{4}$ in., the width of the belt on the cones $1\frac{1}{4}$ in. and the diameter of the spindle pulley 4 in. No. 2 Morse taper sockets are used. The dimensions and weights for the one, two, three and four spindle machines are respectively: Outside size of table, 14 x 14 in., 14 x 26 in., 14 x 35 in. and 14 x 44 in.; working surface, 11 x 11 in., 11 x 23 in., 11 x 32 in. and 11 x 41 in.; diameter of the driving pulley, 8 in.; face of the driving pulley, $1\frac{1}{2}$ in., $1\frac{3}{4}$ in., 2 in. and $2\frac{1}{2}$ in.; floor space required, 33 x 21 in., 33 x 30 in., 33 x 39 in. and 33 x 48 in.; weight, 500, 750, 1000 and 1230 lb.

A Large Purchase of Charcoal Pig Iron.

The American Car & Foundry Company has been negotiating for some time for a permanent supply of high grade charcoal pig iron. The rapid depreciation of hard wood timber has caused many to realize that charcoal will become scarce within the next few years. Michigan, with its large but diminishing supply of maple timber, is now the chief producer of charcoal pig iron.

Charles H. Schaffer of Marquette, Mich., Frederick Smith of Elk Rapids, Mich., and Frank B. Baird of Buffalo, N. Y., after selling their Boyne City Furnace to the Berry syndicate, began the erection of a new plant at East Jordan, Mich. The furnace is now completed and will commence operation prior to January 1. Last week the East Jordan Furnace Company was organized, and a contract was made with the American Car & Foundry Company by which the latter secures the entire product of the furnace for a long term of years. This takes the East Jordan Furnace Company out of the market as a seller, and on the other hand, the American Car & Foundry Company has secured a full supply of charcoal iron for many years to come.

The Foundrymen's Convention at Detroit.—A conference was held recently between the officers of the Foundry Supply and Manufacturers' Association and the American Foundrymen's Association and representatives of the local committee which is preparing for the 1910 convention of the different foundrymen's associations at Detroit. It was decided to hold the convention of the iron and brass founders and the exhibition of foundry appliances in the week beginning Monday, June 6. The sessions of the American Foundrymen's Association and of the American Brass Founders' Association for the reading of papers will probably be held Tuesday, Wednesday and Thursday, June 7-9.

Rolling Speed and Annealing.

Tests Showing Their Effects on Soft Bar Steel.

BY GRANT D. BRADSHAW.

In May, 1908, tests were made on a bar mill for the purpose of determining: first, whether the speed of the rolls had any effect on the physical characteristics of the finished bar; second, whether the slight tempering effect of suddenly quenching a 4-in. billet of soft steel was entirely removed by reheating and rolling into bars.

The mill had a three-high 18-in. roughing stand, which in seven passes reduced the billet from 4 x 4 in. square to an oval about 1 21-32 x 11-16 in. The oval was delivered through a twister, which turned it 90 degrees in a length of about 30 ft. to the 12-in. train. This finishing train reduced the oval in three passes to a 9-16-in. square bar and ran it out on a hot bed, where it was allowed to cool in the air. The 18-in. train was direct connected to the engine, which drove the 12-in. train also by means of a rope drive, so that the same speed relation between the passes was maintained at all speeds. The mill was fed by a Morgan continuous reheating furnace, which normally received hot billets direct from a conveyor from the billet mill. There was provision, however, for charging cold billets into the furnace from the billet yard.

For this test a single ingot, about two tons, was rolled to 4 x 4 in., cut into lengths and run out on the conveyor. Of this one-third was run direct to the reheating furnace; one-third was dumped to the ground and allowed to cool slowly in the air, and one-third was dumped to the ground and quenched with water. This ingot was soft, acid Bessemer steel, and the analysis showed: Carbon, 0.07 per cent.; sulphur, 0.056 per cent.; phosphorus, 0.081 per cent., and manganese, 0.37 per cent. The temperatures recorded were obtained with an optical pyrometer.

Table 1.—Billets Charged Directly Into Furnace While They Were Still Hot.

Temp. at rolls.	Temp. of finish.	12-in. train. Rev.	Feet per min.	Time per in.	Elastic limit.	Tensile str'gh.	Reduc. area.	Elon- of gator.
Deg. F.	Deg. F.	per min.	min.	Sec.			Per ct.	Per ct.
2,035	1,837	240	772	50	43,400	57,600	57.0	28.8
2,190	1,958	240	772	50	43,700	57,800	58.3	29.9
2,140	1,744	160	515	75	45,400	59,400	59.6	29.9
2,073	1,819	150	482	75	44,800	58,200	59.6	30.5
2,178	1,783	135	434	85	44,400	58,100	59.0	30.3
2,215	1,783	125	402	90	44,450	58,100	57.9	29.9

The results of tests on the first lot of billets, those charged directly into the reheating furnace while still hot, are given in Table I. The average temperature at which they entered the rolls was about 2140 degrees F., and the loss of temperature during rolling varied from 132 to 432 degrees F., depending on the time. To obviate any irregularity in the results due to variation in the sample, &c., eight samples were taken from each bar, to be broken in the testing machine, so that every figure of tensile strength, elongation, &c., is the average of eight determinations. The first two tests of this lot of billets were run at the normal speed, 240 rev. per min. of the 12-in. train. The following four tests were each run somewhat slower than the one preceding, until in the last the speed was held at 125 rev. per min., a total reduction of 48 per cent. From a careful comparison of these figures it appears that though there is some slight variation of the physical characteristics, they do not follow the change in speed.

Table 2.—Billets Air Cooled Before Reheating.

Temp. at rolls.	Temp. of finish.	12-in. train. Rev. per min.	Feet per min.	Time in rolls. Sec.	Elastic limit.	Tensile str'gth.	Reduc. of area.	Elon- of gation in 8 in.
Deg. F.	Deg. F.	min.	min.	Sec.	lb.	lb.	Per ct.	Per ct.
2,190	1,998	235	756	55	43,800	58,500	60.7	29.9
2,178	1,944	235	756	55	44,000	58,600	57.1	29.3
2,215	1,819	115	370	80	45,200	59,000	57.2	28.8
2,241	1,783	95	305	95	44,800	59,600	56.3	29.6

Table II takes up the billets that were allowed to cool in the air before reheating. In these tests the first two were run about normal speed, the next at about half, and the last at 95 rev. per min., a reduction of 140 rev. per min., or nearly 60 per cent. As in the previous table, eight samples were broken from each bar and the average given in the table. The elastic limit and tensile

strength appear to have been increased slightly, but it is probably only due to the natural variation, as this effect is not noticeable in either of the other two tables.

Table 3.—Billets Quenched with Water Before Reheating.

Temp. at rolls.	Temp. of finish.	12-in. in train. Rev. per min.	Feet per min.	Time in rolls.	Elastic limit.	Tensile strength.	Reduc. area.	Elon- gation in 8 in.
Deg. F.	Deg. F.	min.	min.	Sec.	lb.	lb.	Per ct.	Per ct.
2,307	1,985	235	756	55	44,000	59,100	50.1	29.1
2,165	1,985	235	756	55	43,900	58,300	55.1	29.7
2,190	1,886	130	418	103	44,300	58,200	51.7	29.8
....	1,837	130	418	100	44,500	58,800	55.1	28.2

The third table, that of billets which were suddenly quenched before reheating, was run in the same manner as table 2, the first two billets being rolled at normal speed and the last two at a speed reduction of 45 per cent. Much the same conclusions seem to present themselves as in the first and second tables. Eight tests of each billet were made as before.

A summary of the entire 112 determinations, 48 being made on steel rolled at normal speed and the remainder on steel rolled much slower, would seem to prove conclusively that with soft steel the speed of rolling, or the rate at which work is done on the hot metal, has practically no effect on the finished bar.

Table 4—Average of Results of Tables 1, 2 and 3.

Elastic limit.	Tensile strength.	Reduction of area.	Elong. in 8 in.	Treatment of steel.
44,390	58,200	58.6	29.9	Billets not cooled before reheating.
44,450	58,920	57.8	29.4	Billets air cooled before reheating.
44,170	58,600	53.0	29.2	Billets quenched before reheating.

When we take up the effect of reheating and rolling in removing the results of previous heat treatment of soft steel we discover a surprising condition. Quenching even soft steel has a distinct tempering effect. To quote Mr. A. E. Hunt (*Transactions A. I. M. E.*, 1883, Vol. xii.): "Soft steel, no matter how low in carbon, will harden to a certain extent upon being heated red hot and plunged into water. . . ." Mr. Hunt gives as an illustration a heat of open hearth steel, carbon 0.15 per cent., manganese 0.29 per cent., which upon quenching gave an increase in tensile strength of 19,000 lb. per sq. in., a decrease of 2 per cent. in elongation and a decrease of 12 per cent. in reduction of area. A reheating to as high a temperature as 2200 degrees F. and further working at that temperature has heretofore always been supposed to remove all such effect, which supposition table 4 effectually disproves. Although the elongation of the steel that had been quenched has been brought back to within 0.7 per cent. of that which was not cooled, the reduction of area is full 5.6 per cent. below standard. Even the billets which were only air cooled show the effect slightly. Considering the slight initial effect of quenching soft steel, would not a higher carbon steel show these permanent effects more strongly?

Revised Navy Specifications for Electric Motors and Controlling Devices.

New specifications of the Navy Department covering electric motors and controlling devices became effective September 3, 1909. Copies of these specifications can be obtained from the Bureau of Supplies and Accounts, Navy Department, Washington, D. C. They are known as 17M1 and 17M2, and are for use in all departments of navy yards and stations. 17M1 covers specifications for direct current electric motors for operating navy yard machinery and supersedes specifications 2M1 issued by the Navy Department June 1, 1908. 17M2 covers specifications for induction motors for operating navy yard machinery, and supersedes specifications 17M2 issued by the Navy Department October 9, 1908. For the benefit of those bidding on electrically driven machinery for the Navy Department, the Cutler-Hammer Mfg. Company has issued a circular calling attention to these specifications and indicating what they cover. The circular also explains with reference to controlling apparatus which of this company's products are admissible under the specifications.

A New Acme Screw Machine.

Changes have been made in an improved screw machine and turret lathe recently brought out by the Acme Machine Tool Company, Cincinnati, Ohio, that render it powerful enough to use high speed steel tools and otherwise contribute to rapid producing capacity, as by increasing the convenience of its operation. Front and

ing any binding due to the unequal expansion of the steel spindle and the cast iron bed.

The automatic chuck is forged solid on the end of the spindle, reducing the overhand from the front bearing and supporting the collet out to its extreme end. A master collet is furnished with each machine and a set of bushings to take stock of sizes up to the largest the machine will admit. The chuck and stock feeding lever

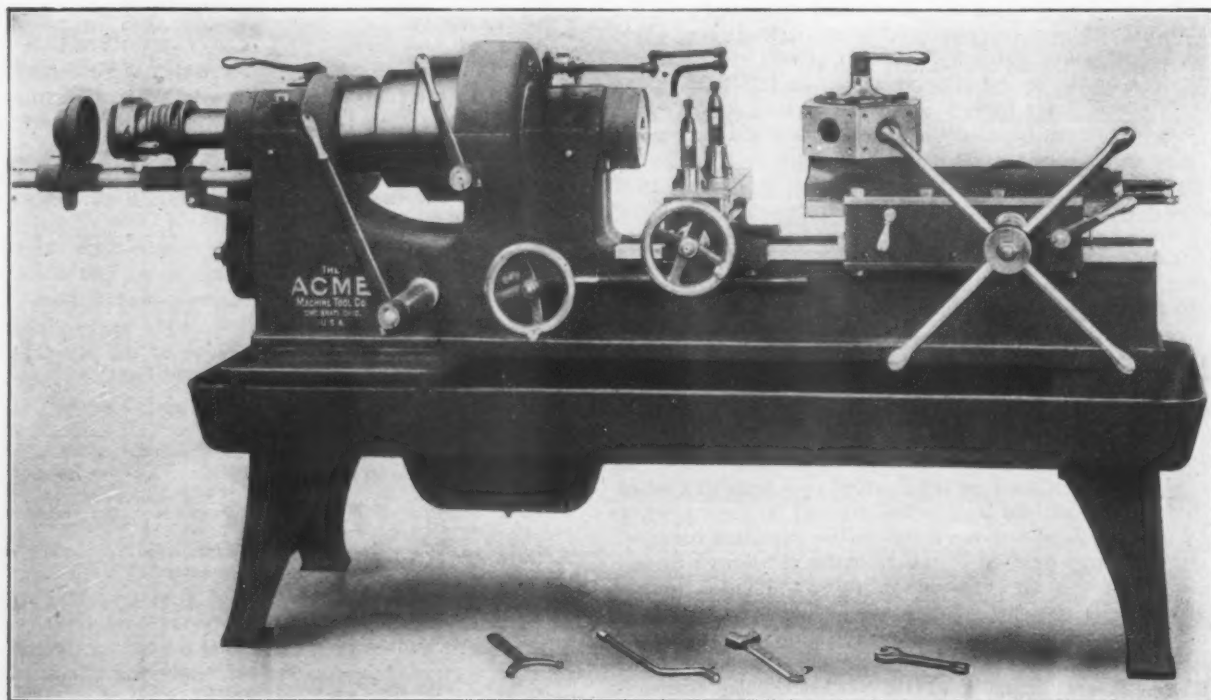


Fig. 1.

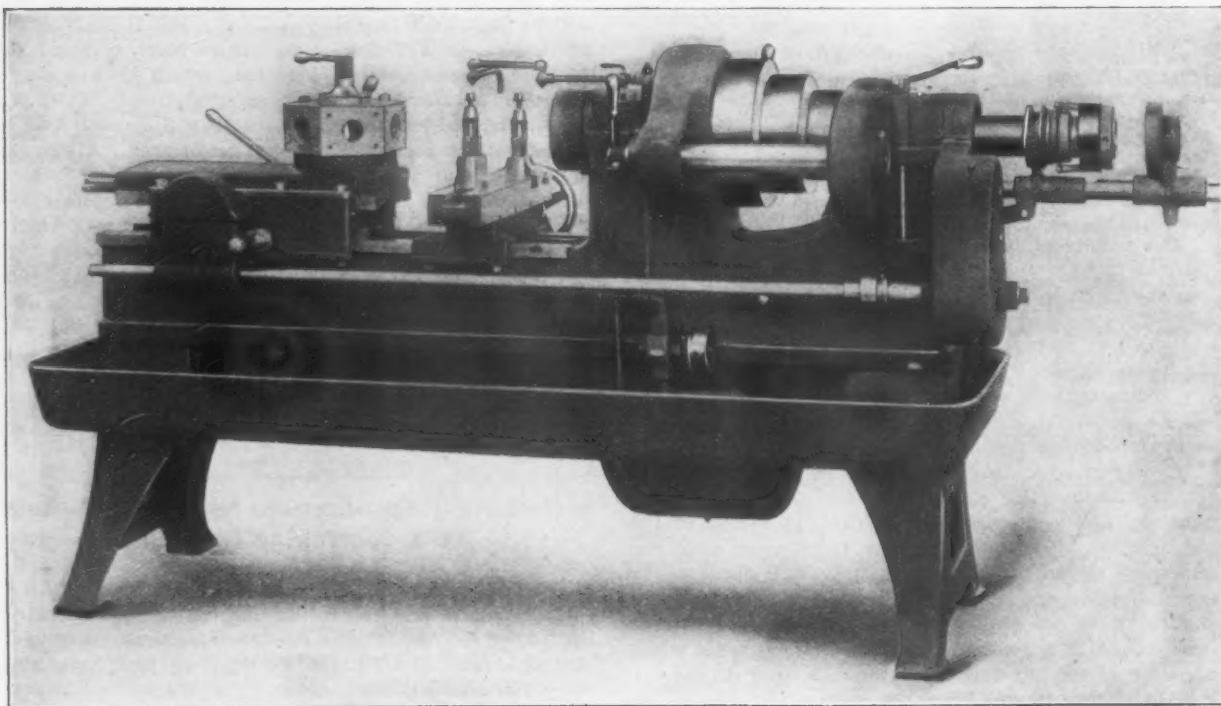


Fig. 2.

Front and Rear Views of the Improved Screw Machine and Turret Lathe Built by the Acme Machine Tool Company, Cincinnati, Ohio.

rear views of this machine are given in Figs. 1 and 2.

The head is cast solid with the bed and is provided with a three-step cone pulley and friction back gears, so arranged that the spindle can be stopped by throwing the operating lever in the middle position. Attention is called to the deep chip pan, which is made to hold a liberal quantity of chips, thus doing away with the necessity of cleaning it out very frequently. The spindle runs in ring oiling babbitted bearings of ample size. All end thrust is taken by the front bearing, thus avoid-

ing any binding due to the unequal expansion of the steel spindle and the cast iron bed.

The turret is hexagonal in form and is provided with tapped holes for attaching tools to its face, in addition to the regular holes with binder bushings for the shanks of tools. A hole the same size as the holes in the turret is bored through the turret stem, thus allowing long work to be passed through so that it may be

turned with short stiff tools. The tool clearance over the top of the slide is made extra large to permit the use of large dies and turret tools. The turret slide is made wide to give extra rigidity to the turret and tools. Independent adjustable stops are provided for each hole

enough oil to run a month or more without refilling. Ample adjustment for wear is provided for by loosening screw *h*. The pulley *e* can be adjusted along the bearing sleeve *d* by turning the nut *f*. This adjustment is a point that will be appreciated by those who have had to take

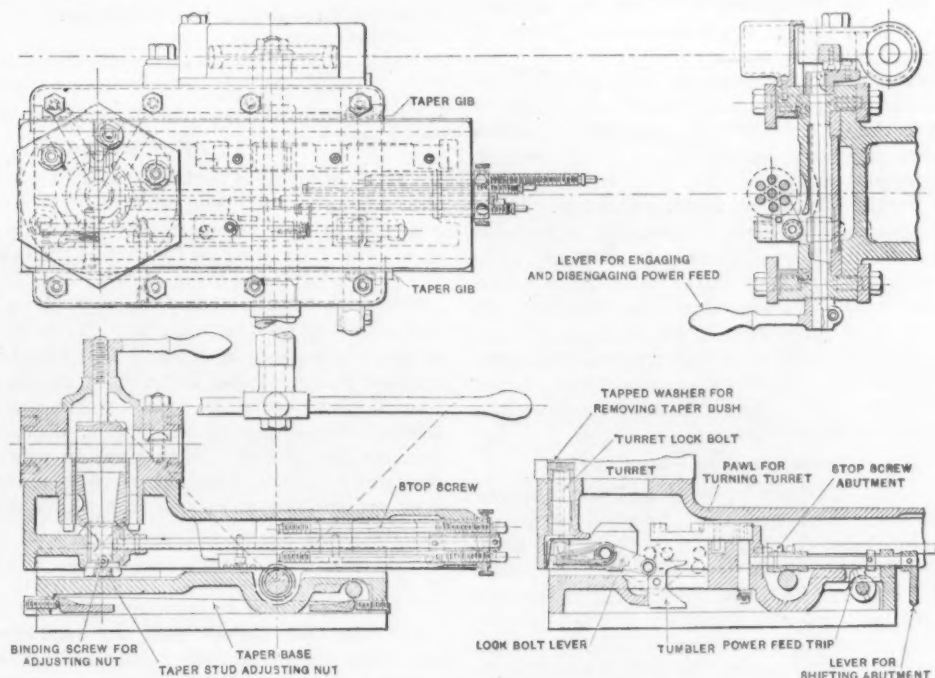


Fig. 3.—Details of the Turret and Its Slide.

in the turret; the abutment for stops can be shifted to allow a slight further movement of any tool beyond the stop when desired without disturbing the adjustment of the stops. The power feed is of the geared type, giving four changes instantly obtainable by the movement of a lever placed directly over the rear spindle bearing. The construction of the turret and its slide is shown in the details given in Fig. 3.

The cut-off slide is provided with a large graduated dial and positive stops for the cross slide, and also hand longitudinal adjustment through a hand wheel and screw operating in a bronze nut on the front cap. The screw is completely protected from chips and dirt by two steel

a countershaft down and face off the hub of the pulley to get more adjustment.

Swedish and Norwegian Electric Smelting.

Interesting news comes from Stockholm about projects for establishing plants for producing iron by electricity directly from the ores in Sweden and Norway. Two very large establishments are planned for immediate construction, one at the Trallhätta Falls near Gothenburg, and the other on the Hardanger Fiord in Norway.

The process is the invention of engineers A. Grönwall, A. Lindblad and O. Stalbane, who have sold their patent to the Iron Kontor, a combination of all the big Swedish iron works. The latter has already secured ground at Trallhätta for the erection of its plant. The great electrical station now building at the Falls, to be one of the largest in Europe, will soon be completed; it will supply the new company with power at a very low price. The process itself has already been in practical use for some time at Domnarfvet, and the results have been so satisfactory as to insure the success of the big undertaking at Trallhätta. The Kontor, it is said, gets the use of the patents at a considerably lower price than other countries will have to pay. They have been acquired for Norway by the Norsk Elektrometal, which is now organizing a special company to operate it first. The company will soon be constituted and will proceed at once to erect the establishment on the Hardanger Fiord. At first furnaces with 2900 hp. and a steel mill of 800 hp. will be built, and later a rolling mill of 700 hp., the power to be generated at adjacent waterfalls. Norwegian ores will be used, which are abundant, and transportation is extremely cheap.

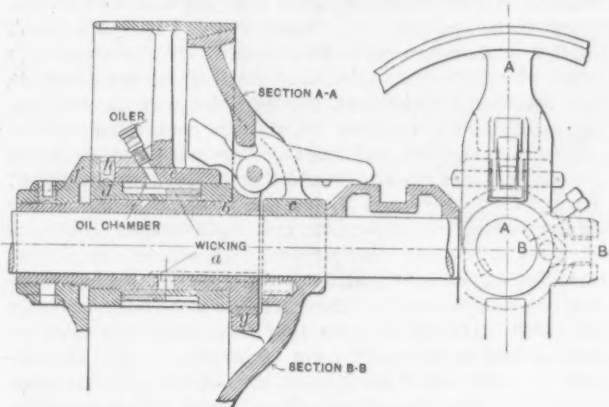


Fig. 4.—Details of the Improved Friction of the Countershaft.

tubes fastened to the nut. The cut-off slide is also supplied with power cross feed when desired.

The machine is so arranged that power feed to the turret, power feed cut-off, &c., can be applied subsequent to purchase without additional work. The stock feed can also be attached at any time to a machine with the automatic chuck without altering the spindle. A double friction countershaft of improved design accompanies each machine.

Referring to Fig. 4, *a* is the shaft, *b* the driving sleeve which is keyed to the shaft and *c* the friction which is connected to the shaft by drivers *g*. The bearing sleeve *d* is a sliding fit in the pulley hub *e* on the driving sleeve *b* and is provided with a large oil chamber, holding

C. C. & E. P. Townsend, New Brighton, Pa., manufacturers of wire nails and also rivets up to $\frac{1}{2}$ -in., are building an addition to their plant consisting of a two-story building of brick and steel construction, 115 x 400 ft. in size. The contract for the steel work has been placed with the McClintic-Marshall Construction Company, Pittsburgh. The boilers and engine equipment have been ordered and the other machinery will be contracted for later. The new addition is expected to be ready for operation in February and will considerably increase the productive capacity of the works.

Profit Sharing, Benefits, Pensions.*

The Underlying Principle of the International Harvester Company's Plans.

BY GEO. W. PERKINS.

In the progress and development of American business methods there is probably no subject more worthy the attention of the Civic Federation than the one which is under discussion at this conference, for profit sharing, insurance, pensions, welfare work, &c., are vital elements in the relations between capital and labor. If, as many of us have come to believe, co-operation in business is taking and should take the place of ruthless competition; if this new order of things is better for capital and better for the consumer, then in order to succeed permanently it must demonstrate that it is better for the laborer. And if profit sharing, pensions, insurance and the like mean anything, they must mean co-operation between capital and labor, co-operation in the broadest, most helpful and enduring form.

Why Some Profit Sharing Plans Fail.

Plans for profit sharing, pensions and the like are not new in American business. They have been tried off and on, here and there, in various forms for a long time, and up to a few years ago many of them had fallen more or less short of success. It is my judgment that the reason for this can be found almost wholly in the fact that the unsuccessful plans did not embody a true, an honest and a fair spirit of co-operation. A secret, perhaps almost an unconscious, purpose existed to benefit the business in question out of proportion to the labor employed in the business; and no such plan having such a purpose can permanently succeed, for the selfish points in it will work to the surface sooner or later and cause failure.

On the other hand, there should be no sentimental philanthropy about this great question. It is purely a business question. Profit sharing, pensions and the like from a pecuniary standpoint are a profitable thing for a business and also for its labor, or for neither. No American worthy of being called a man wants something for nothing.

Because of the enormous growth of business affairs in the United States many business concerns have passed beyond the period where one man or even twelve men can keep a close supervision over all the branches of a given business undertaking. Now it goes without saying that no business will run itself, either in its executive functions or in the machines themselves at the factory or plant. In all the inventions and ingenuity that have been brought to bear on business affairs in the last quarter of a century, nothing has been found to take the place of the human mind, nothing has been found to take the place of individual incentive to accomplish results. Nothing has been found to take the place of a man's ability to do, with a proper incentive behind that ability, and no such substitute ever will be found. It is, therefore, of the utmost importance to American business interests of to-day and to-morrow that every man in any given concern be so associated with that concern that he will give the best there is in him to the performance of the duties assigned to him. There is a vast difference between the work that a human being performs in a perfunctory, machine-like manner and the work that he performs with a keen, loyal interest in what he is doing; and in just this difference does success come to the individual and come to a large concern, if it be so fortunate as to have a force of individuals who are working with this spirit.

If profit sharing means anything, if providing for old age means anything, if caring for those who become ill or injured while in the service means anything, it should mean the fostering of the interest of men in their work, whether that work be sweeping out the office, shoveling coal or presiding over a great commercial company. In short, it should mean real co-operation between stockholders, managers and employees.

* A paper read at the annual meeting of the National Civic Federation, New York, November 23, 1909.

The management of the International Harvester Company and its subsidiary and affiliated companies, believing in the above theories, set out several years ago to see how nearly it could come to applying them practically to its business. As a result it has devised and put into effect plans covering the following:

1. Profit sharing.
2. Insurance covering sickness, accident and death.
3. Old age pensions.

Briefly stated, these three plans are as follows:

1. Profit Sharing.

Profit sharing is divided into two heads. Under the first one a certain sum of money is set aside by the company in cash out of its earnings each year—the size of the sum depending on the size of the company's profits, the percentage scale being stated. This is for immediate distribution in cash among the men who make a satisfactory showing for the year. The distribution of the sales department's share in these profits is based upon two important points: First, increase of sales; second, reduction of selling expense. In the works the profits are distributed for increased production, decreased cost or a combination of both. Employees in any branch of the company's service showing marked ability during the year are entitled to receive recognition under this profit sharing plan.

The second classification of profit sharing is the sale of the company's stock to its employees. This stock is purchased outright by the subscriber on an installment plan. The total amount that any employee is allowed to subscribe for is limited to the amount of his annual salary, and he cannot pay in excess of 25 per cent. of his salary in any one year; therefore, all are treated alike.

Of the preferred stock 12,500 shares and of the common stock 15,000 shares were offered for sale last July at a price below the then market value. In addition to the regular dividends there is allowed a bonus of \$4 and \$3, respectively, on each share of the preferred and common stock, each year for five years, the only condition being that a man must be in good standing in the company's service during each of these years, have his stock and either have paid or be paying for it. In such cases, as the men leave the company's service or discontinue paying for their stock, the company continues placing these \$4 and \$3 payments on such stock into a fund, and at the end of five years this fund will be divided among such subscribers as fully paid for their stock and remained in good standing in the company's service during the five-year period. The result of this plan, in a word, is that a man begins to buy a share of the company's stock at a price below the market value; he is allowed to pay for it in installments, paying 5 per cent. on deferred payments; he is credited with 7 per cent. dividends on the preferred stock and whatever dividends are declared on the common stock. In addition to this, he is credited each year with \$4 and \$3 per share, respectively, on the preferred and common stock, and at the end of five years receives a further benefit by way of a share in a fund made up of such \$4 and \$3 deposits as are made by the company on account of those who do not continue under the plan. It will be seen that this offers the men an exceedingly satisfactory form of investment in the business in which they are employed, and gives to the company the great advantage of anchoring its organization to the business.

The stock offered last summer was largely oversubscribed and the company to-day has over 4300 employees as stockholders.

2. Benefit Plan.

On September 1, 1908, the Employees' Benefit Association of the International Harvester Company was inaugurated. This association was organized for the men and it is to-day run by the men. It is governed by a board of 30 trustees, one-half of whom are elected by ballot. The contributions are 2 per cent. of the employee's wages or salary, and the benefits derived are as follows: Two years' pay for death due to accident, one year's pay for death due to sickness, and half pay for disability due either to sickness or accident, &c.

The membership in this association is purely volun-

tary, and no one joining and later receiving benefits is required to waive any legal rights. That this may be a co-operative movement the company's share in the plan is an annual contribution of \$50,000 to this association, provided the average membership equals 75 per cent. of the employees in the factories and works. Over 75 per cent. have joined and, therefore, the company is making its contribution of \$50,000. The best answer to the question whether the men approve of this association is made by stating that 21,600 people are contributing members to it. In the first 14 months of its existence over \$200,000 has been disbursed in benefits.

3. Pension Plan.

The pension plan was inaugurated as a recognition of long and faithful service. All employees 70 years of age and over and who have worked for 20 years are pensioned, while employees who have reached the age of 65 years may voluntarily apply for a pension. The minimum amount of pension is \$18 per month and the maximum \$100 per month. The company has not favored higher salaried employees at the expense of the laboring man. All pensions are figured on the same basis—that is, on the pay a man receives during his employment and on his length of service. Therefore, there are no inequalities in the amounts paid. All the benefits and expense of the pension plan are borne by the company itself, no contribution of any kind being made to this plan by the employees.

Welfare Work.

The company is also doing welfare work. It is called welfare work for lack of a better name. It is as much a business branch of the company as any other division. The important features of this work are protection against injury, sanitation, health, educational work, charities, recreation, &c. The welfare work is controlled by an advisory board composed of the superintendents of all of the works, who, through an Executive Committee, dictate the welfare activities of the company. Special attention is given to protection against injury and to sanitation. The accident hazard can never be removed because of the human element; that is beyond the realm of possibility. Therefore, the company is trying to arrive at the point where the occupation is surrounded with every known safeguard, and only the man is the hazard. The foreman of each department is impressed with the fact that he is the one who is responsible for the safety of his men, and by securing the co-operation of every one it is hoped to establish a standard that will be of benefit and use to others. Improved sanitary conditions mean better health, and better health means better work; and this matter is having the constant attention of the company's managers of welfare.

In the year 1908 the International Harvester Company spent about \$100,000 in its welfare work. This year it will probably spend a somewhat larger sum.

The company has been criticised by managers of other companies for making the plan above outlined too liberal and attractive. It has been said that the plans will be too expensive to the company and that their cost will be very large. There is no doubt of the truth of this criticism in so far as the cost goes. No concern has ever put out plans that involved the application of so large a percentage of its profits to such plans. But the Harvester Company did not do this out of pure philanthropy. It had no intention of passing around a hat full of money, that employees might help themselves. It went into these enterprises in a purely business spirit, believing that the plans would so knit its vast organization together, would so stimulate individual initiative, would so strengthen and develop the *esprit de corps* of the organization as to make it possible for the company to increase its business and its earnings, and with the spirit of being willing to share this increased success with its organization. So far the company has every reason to congratulate itself on the result. In all parts of the company's business, at home and abroad, in the office force, in the factories, in the sales department, everywhere, the average interest of the individual in the business is greater than formerly. The saving of the waste

here, there and everywhere is noticeable. The employees throughout the organization are vying with one another more and more to improve their respective branches of the business. This means profits for the stockholders, means extra compensation in various ways for the employees; in short, means co-operation that is real, that is beneficial to one and all.

A New Wells Polishing and Finishing Lathe.

For doing polishing, burring, &c., and all kinds of light work that can be held in a spring or collet chuck, the F. E. Wells & Son Company, Greenfield, Mass., has introduced the No. 113 polishing and finishing lathe illustrated herewith. The chuck is opened by the foot lever, which at the same time shifts the belt to the loose pulley and applies a friction brake to stop the machine imme-



The No. 113 Polishing and Finishing Lathe Built by the F. E. Wells & Son Company, Greenfield, Mass.

diately. When the pressure on the foot lever is released a spring shifts the belt back to the tight pulley and closes the chuck. In this way both of the operator's hands are left free for handling the work. The machine is declared to be a great time saver on many operations.

Included in the equipment furnished are the following: a countershaft, a spring or collet chuck, one collet, a tee rest and holder and a table on the bed. The bed is 42 in. long. The lathe will swing 11 in. over the bed. The capacity of the chuck is $\frac{1}{8}$ to 2 in.; the width of the driving belt is 2 in., and the weight is 625 lb.

Basic Steel Plant at Niles.—The Basic Steel Company, Incorporated at the same time as the De Forest Sheet & Tin Plate Company, and with the same officers and stockholders, will begin in a short time the erection of a basic open hearth steel plant in Niles, Ohio, on a site adjoining the plant of the De Forest Sheet & Tin Plate Company. The new plant will have a daily capacity of about 500 tons of billets and sheet bars, and, in addition to supplying sheet bars to the De Forest Company, will sell bars in the open market. Plans for the new plant are being prepared and contracts for the buildings and equipment will be let in a short time. The directors of the Basic Steel Company are: Harry M. Stevens, W. A. Hutchings, W. R. Thomas, G. P. Gillmer, Charles S. Thomas, D. A. Strickland and Wade A. Taylor. Wade A. Taylor is president and treasurer and Charles S. Thomas is vice-president and secretary.

The No. 1 Tilted Turret Screw Machine.

A new size of the tilted turret screw machine, one of small capacity, has lately been placed on the market by the Wood Turret Machine Company, Brazil, Ind. This, known as the No. 1 machine, is shown in Fig. 1, and has an automatic chuck capacity of $\frac{3}{4}$ in. Although of extremely small size, it is a complete screw machine in every particular, having an automatic bar feed and automatic chuck, independent, adjustable stops for each hole of the turret, together with a simple provision for instantly setting the machine for non-indexing work. The turret, as will be noticed, is tilted as in the larger size machines. This exclusive feature on these machines allows the stock to be passed into or directly through the turret head, since the center bolt has a hole directly through it, coming out at the rear through one of the auxiliary holes in the lower half of the turret without interfering with a tool in the rear position; the strain on the center bolt is minimized, due to the fact that the tilt of the turret applies part of the thrust directly on the

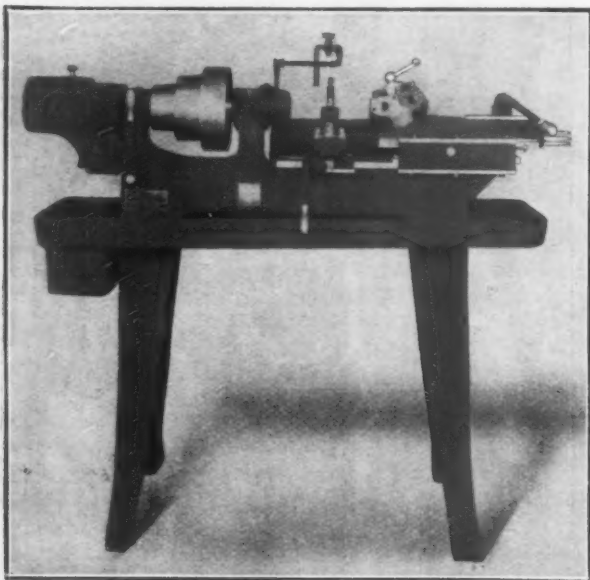


Fig. 1.—The No. 1 ($\frac{3}{4}$ -In.) Tilted Turret Screw Machine Built by the Wood Turret Machine Company, Brazil, Ind.

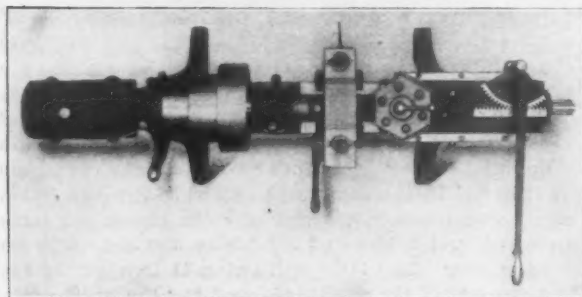


Fig. 2.—A Top View of the No. 1 Tilted Turret Screw Machine.

slide, eliminating largely the tendency to tip that is present in an ordinary style high turret. This tilted turret head facilitates swinging a larger die head or box tool than any other machine of the same capacity and the same swing. The new size has proved very popular with the manufacturers, as it gives them a small machine well suited for handling the smaller class of screw machine work and having the desirable features of large expensive machines.

The drive is through a three-step cone pulley adapted to take a 3-in. belt. *The combination of large belt area and the self-oiling spindle bearings and self-oiling countershaft makes it possible to attain high speeds for brass work with a full driving power.

In Fig. 2 is shown a top view of the machine, with the oil pump, pan and tank removed, which gives a good idea of the general proportions of the machine. This view brings out very strongly an exclusive feature of the

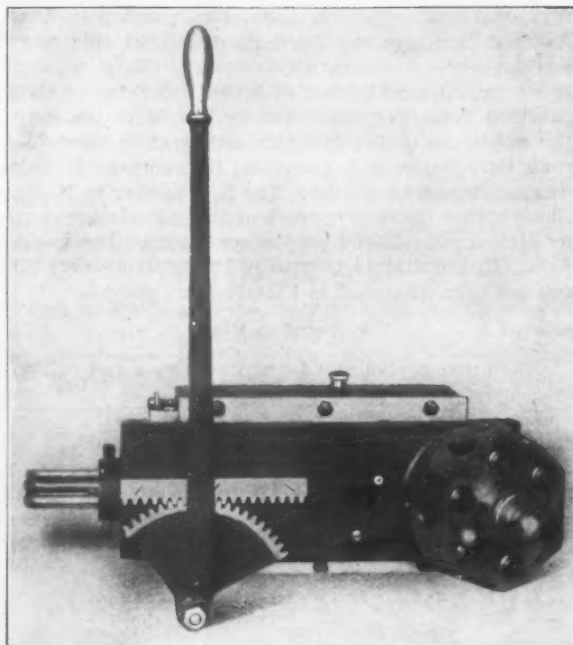


Fig. 3.—Detail of the Lever Motion of the Turret Slide

No. 1 machine, that is the length and arrangement of the lever feed motion to the turret slide. This size is furnished with a lever motion to the turret slide in place of the turnstile method of operation.

Fig. 3 shows a nearer view of the lever motion to the turret slide, which is an arrangement of a rack and sector. The sector and the lever are fastened together in one piece, and the rack secured to the turret slide meshes with this sector. Through this arrangement the operator will always exert the same power against the work, obtaining at all times the same effective leverage. By this manner of operating a greater effective motion can be applied to the turret slide, so that longer cuts can be taken than on other machines of the same capacity.

Ordinarily on small screw machines where a lever is used to operate the turret slide, the lever is secured to the slide, as the fulcrum point having leverage on a post secured to the saddle, the result is a changing leverage, where the operator has to exert more power at the start and finish than in the middle of the stroke. The result

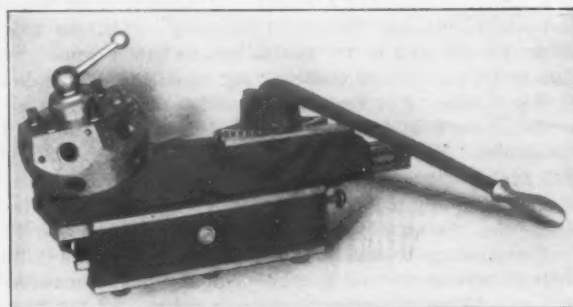


Fig. 4.—Detail Showing Provision for Aligning the Turret Holes with the Spindle Center.

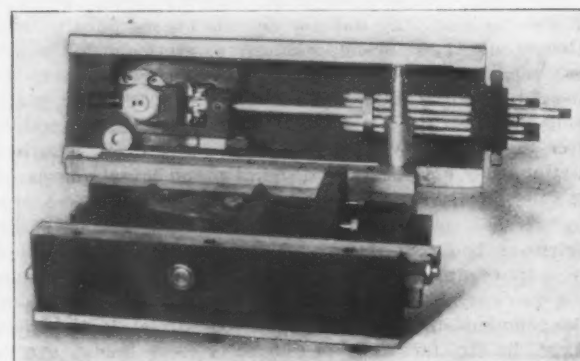


Fig. 5.—Detail Showing the Saddle Construction and the Automatic Independent Stops.

is a much shorter effective motion than that secured by the rack and sector method.

In Fig. 4 is shown clearly the provision for aligning the turret holes with the center of the spindle. As will be seen there is a supplementary taper base to the saddle.

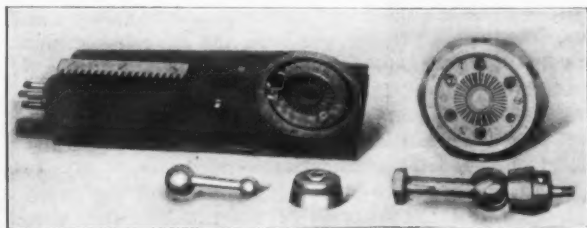


Fig. 6.—The Turret Head Removed from the Slide, Showing the Hole Through the Center Bolt.

by which the exact height of the center of the spindle can be adjusted. The turret slide, which rests and moves in the saddle, has on either side means of adjusting the slide sideways. This complete arrangement for aligning the turret holes means the elimination of frequent re-boring of the turret holes. This and the positive alignment of the machine at all times is very important on a machine of this type.

The interior construction of the saddle and the arrangement of the automatic independent stops is best shown in Fig. 5, which makes clear the manner in which the non-indexing feature is operated. The pulling out of the knob on the front of the saddle causes the indexing finger to swing out clear of the star, and as a result the turret head remains stationary.

In Fig. 6 is shown the turret head removed from the slide, showing the hole through the center bolt, which permits passing stock through it. A good idea of the operation of the turret head may also be obtained from the engraving. It may also be noticed that the lock pin holes are bushed, so that any wear that may occur may be taken care of by rebushing the holes, and thus securing at all times a firm seat of the turret head on the slide.

These machines may be seen in operation in the demonstration shops of Hill, Clarke & Co., Inc., of Boston and Chicago, and their branch offices at New York, Philadelphia and Cleveland.

The Baker No. 0 Cylinder Boring Machine.

The latest addition to the line of machines built by Baker Brothers, Toledo, Ohio, for boring automobile cylinders is the smallest of a range of five sizes and types of single, double and four-spindle machines. This machine is designed for boring short cylinders and similar work, and is rated to bore cylinders $3\frac{3}{4}$ in. in diameter by 8 in. long. While this is the diameter at which maximum production can be realized, the machine will easily bore much larger diameters, as it is sufficiently powerful. The machine is adapted to boring single cylinders, twin cylinders or four cylinders cast in block.

The method of handling the work is such that the cylinders may progress from one spindle to the next without interruption for rough boring, straightening and reaming, or they may be laid aside for seasoning between any of the operations. It is customary to set these machines up in gangs of three or four units. Where cylinders are reamed they are roughed under the first spindle, straightened under the second and reamed under the third. When but two cuts are taken before grinding, they are roughed in the first and third spindles and straightened in the second and fourth.

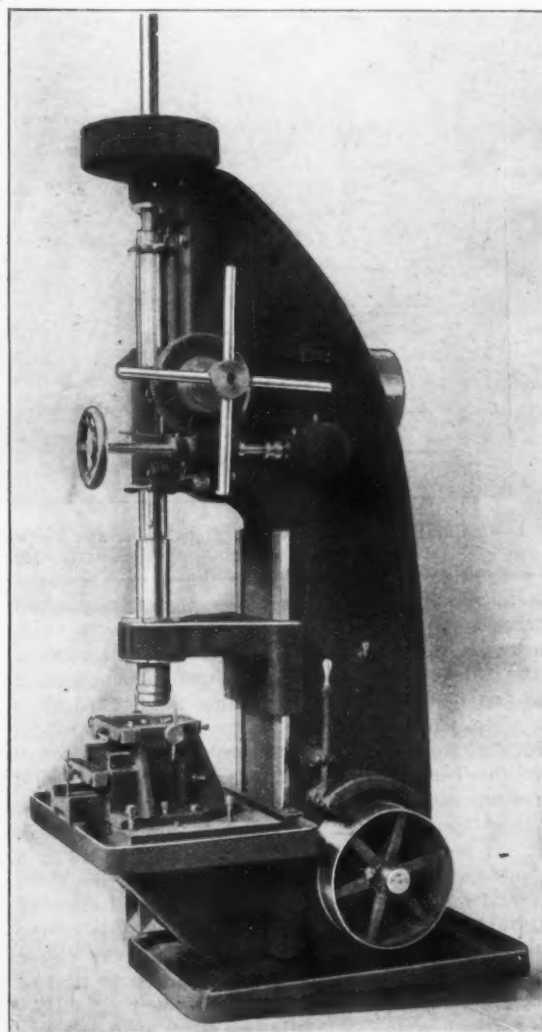
The machines are also built with a special attachment for boring, facing and tapping seats in automobile cylinders, either two or four tools being carried by each spindle. The illustration shows the machine with a fixture for holding a unique type of open end cylinder.

The makers of these machines have followed the boring of automobile cylinders since the early stages of their manufacture and are prepared to design and build tools and fixtures for boring all types of automobile

cylinders, or they will be pleased to extend to prospective customers the benefits of their extended knowledge of this subject. The machine is equipped in every case with the maximum size bar that will enter the cylinder.

Particular attention is called to the support for the boring bar. This is a very substantial bracket secured to the front of the machine and carrying a bronze bushing securely fitting a taper seat, which allows it to be adjusted to fit the hardened boring bar very closely. The cutter is held very close to this rigid support and hence will not follow the cored hole.

The machines are adapted to high speeds and feeds being thoroughly well built and massive in every detail. All shafts are ground; all bearings are bronze bushed. The majority of the gears are steel, running in a bath of oil, and many of them are hardened. The machine swings 12 in. from the center of the spindle to the frame. It has eight speeds obtained quickly by sliding gear changes, and 12 changes of geared feeds are provided. The drive is to a single pulley, with adjoining loose



The No. 0, the Smallest of Five Sizes of Automobile Engine Cylinder Boring Machines Built by Baker Brothers, Toledo, Ohio.

pulley, so that the machine may be belted direct to the line shaft, allowing any number to be set up in gangs. The weight of one machine is 3500 lb., and the floor space occupied is $3\frac{1}{2}$ ft. square.

Cincinnati will be the next meeting place of the Ohio Society of Mechanical, Electrical and Steam Engineers. At the annual convention in Lima, which closed November 20, O. F. Rabbe of Toledo was elected president, Grant Miller of Toledo vice-president, F. E. Sanborn of Columbus secretary-treasurer. The next meeting will be held some time in May, 1910, the exact dates being determined later by the executive committee.

A Brown & Sharpe Universal Grinder Head.

The quality and quantity of finished work is seriously impaired by employing dull or inaccurately sharpened cutting tools. In many small shops, however, the volume of tool and cutter grinding does not warrant installing machines for this purpose alone, and for this reason the Brown & Sharpe Mfg. Company, Providence, R. I., has recently placed upon the market a universal head for use on all its universal grinding machines, and also on its No. 13 universal and tool grinding machine. By using this head reamers, milling cutters, counter bores, counter sinks, drills and a large variety of other cutting tools commonly used in the machine shop can be quickly and accurately sharpened. It is simple in design, con-

been designed with care to obtain the maximum rigidity. To this end the bearing surface on the base plate is made very large and the column is of particularly stable construction. It swivels in a horizontal plane and may be set at any angle with the table. A dial graduated in degrees, encircling the entire circumference of the base, facilitates quick adjustment to any desired angle. Two bolts, which pass through the base and slide in circular slots in the base plate, serve to securely clamp the column. The face of the vertical column to which the work head is clamped is scraped to surface plates, which are kept true with a master plate. Thus a mechanically accurate flat bearing surface is obtained.

In the convenience and adaptability of the work head are found the features of the attachment. It is simply and compactly constructed and has a large bearing surface on the vertical column, thus making it fully

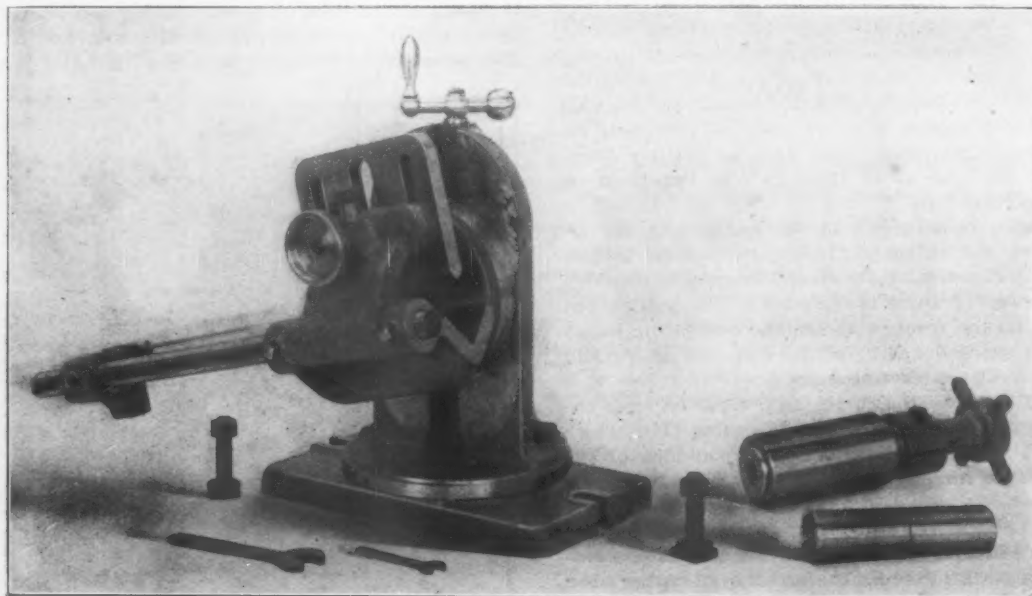


Fig. 1.—A Universal Head for Supporting Cutters and Tools While Being Sharpened on Brown & Sharpe Universal Grinding Machines.

venient to operate and can be easily placed in position or removed.

It consists in the main of a swivel vertical column, upon the side of which a swivel head for supporting work is fastened. The vertical column is mounted upon a base plate, which in turn is securely fastened to the table by a clamping bolt at either end, passing through slots in the base casting. The base plate is of solid construction and has a large bearing surface on the table, thus insuring a rigid support for the vertical column. It is made in two styles, one of which has a tongue on the under side to fit the tee slot in the table of universal machines; the other a longitudinal vee way that fits over a way of like design on the table of the No. 13 universal and tool grinding machine. In either case the alignment of the head, with relation to that of the table, is correctly and simply maintained.

The vertical column supports the work head and has

capable of resisting vibrations due to the action of the wheel on any work within the range of the attachment. The head swivels in a vertical plane and may be clamped at any angle up to 90 degrees either side of zero, its position being indicated by a dial graduated to degrees on the circumference of the base. The clamping bolts pass through circular slots in the head casting and vertical slots in that of the column.

Provision is made for a vertical adjustment of 4 in., which is controlled by a ball crank at the top of the elevating screw. With the head at its extreme height, work up to 16 in. in diameter will swing over the table; by turning the head at right angles, light work up to 24 in. in diameter can be accommodated.

Two methods of holding work are provided; milling cutters being clamped directly by their shanks or arbors in a V-shaped vise, as in Fig. 2, while work requiring sliding shells is supported on a rod known as the cutter

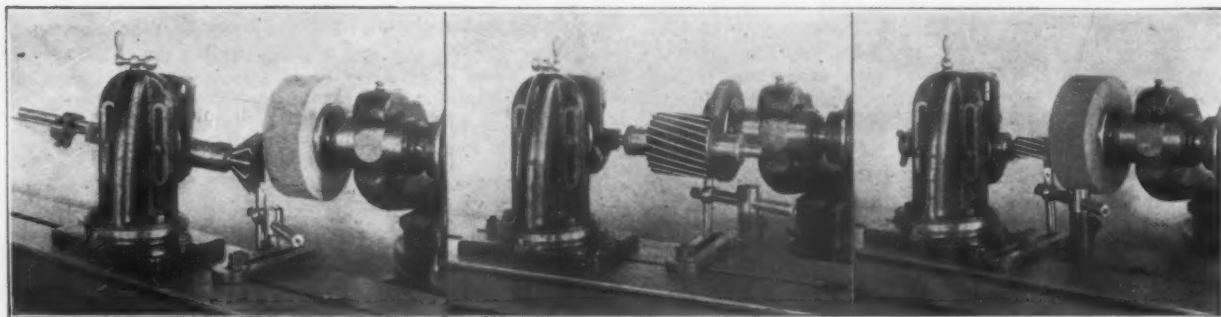


Fig. 2.

Fig. 3.

Fig. 4.

Applications of the Brown & Sharpe Universal Head: Fig. 2. An Angular Cutter Supported in the Vise of the Head While the End Teeth Are Being Ground; Fig. 3. A Spiral Milling Cutter Mounted on the Cutter Bar; Fig. 4. The Taper Shank Mill Sleeve in Use.

bar, as in Fig. 3. The vise is rigid and is readily adaptable to many varieties of work. The lower jaw consists of a heavy V-shaped trough in which the shank or arbor of the work is placed. The upper jaw pivots and is adjusted by a hand clamp screw. A long drop back rest is carried by the upper jaw. To fasten work, this rest is lowered until it touches the piece and is clamped in this position. Then by simply adjusting the hand clamp wheel the drop back rest is securely fastened upon the piece.

An adjustable center rod is provided for supporting and taking the end thrust of work having a tapered shank; it may also be used for taking the end thrust of centered pieces that are not clamped solidly in the vise while grinding.

The cutter bar is made of steel, $\frac{3}{4}$ in. in diameter, and has a flat side for clamping screws to seat upon without injuring the working surface. It is supported in bearings in the work head casting and, in addition to holding work to be ground, serves as an arbor for the upper portion of the vise to pivot upon. It can be adjusted to any length and clamped by set screws. An additional cutter bar $\frac{3}{4}$ in. in diameter can be furnished when so desired.

A device known as a taper shank mill sleeve is furnished with the universal head, and is particularly useful in grinding work having taper shanks, such as end mills, &c. This is shown in use in Fig. 4. It consists of an outer sleeve that can be rigidly clamped in the vise, and a taper bushing in which the work is held. The bushing is free to turn in the sleeve, but is held positively against the end of the sleeve by a spring. A handle fastened to the outer end of the bushing serves to hold the work against the tooth rest, as well as for indexing. Two taper bushings are furnished with the attachment, one No. 7 and the other No. 9.

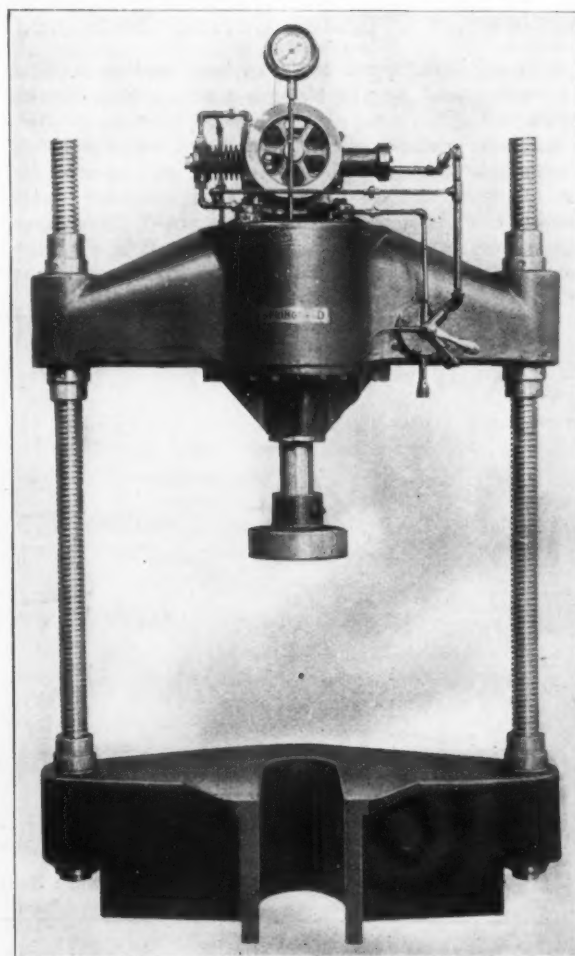
A New Springfield Pneumatic Press.

A pneumatic press for driving forced fits of machine parts, taking the place of a screw press for such work, is being built in an improved form by the Springfield Machine Tool Company, Springfield, Ohio. Among its new features is an auxiliary pump on the top of the press through which the initial air pressure may be tripled when required. Particularly in shops having very many drive fits to make the machine is declared to be a great time saver by accomplishing the work rapidly and easily. Its design permits it to be placed almost anywhere, as the position of the line shaft from which the belt drive is taken does not have to be considered. It is economical also from the fact that there is no power required while the press is idle. It is very massive and heavy, and is capable of exerting a downward pressure of 20 tons.

The press consists of two main frame castings held together by massive screws on each side. The base is very heavy and will admit a large wheel placed centrally between the screws. The opening shown in the lower base permits any piece, such as a spindle, to be driven downward, and has the advantage over the plain circular opening in that the work does not have to be lifted high and then dropped into the hole, but merely has to be lifted to a normal height, such as that of a bench, and then pushed into place. This applies, for example, in the driving of a lathe spindle into a face plate.

The upper frame is also very heavy, and contains the air cylinder from which the power is derived. The piston is of a peculiar construction, which has been found by experience to be desirable when holding an air pressure of 225 lb. The lower piston rod carries a heavy shoe which is faced on the bottom with babbitt, so that the work under pressure will not be injured. The two upright screws on the sides carry the upper frame by means of the nuts shown above. These nuts are adjustable, so that the upper frame may be raised or lowered according to the work to be done.

Above the cylinder the automatic auxiliary pump is mounted. The controlling valve shown at the right of the upper frame has entire command of the operation of the press. One position of the lever through which



A Pneumatic Press for Driving Forced Fits, Built by the Springfield Machine Tool Company, Springfield, Ohio.

the valve is manipulated raises the cylinder; the next position admits the initial air pressure over the piston, and should this pressure prove insufficient to drive the work together, the third position automatically starts the pump, which gradually increases the pressure to the desired point. The valve affords a very sensitive adjustment of the piston movement, which is highly desirable in a press of this kind.

The following are the principal dimensions:

Distance between upright screws, inches.....	38 $\frac{1}{2}$
Maximum distance between bottom of plunger, when up, to top of base, inches.....	42
Opening in base, inches.....	7
Diameter of piston, inches.....	15
Maximum pressure (when initial pressure is 80 lb.), pounds.....	225
Floor space required, inches.....	24 x 48
Stroke, inches.....	8
Net weight, pounds.....	2,000

A gauge is furnished to indicate to the operator exactly what pressure is being applied to the work.

New American Radiator Plant for Kansas City.

Construction work is to be started at once on a large plant for the American Radiator Company, Chicago, in Kansas City, Mo. The new plant is to be located on a 16-acre tract of land just north of Twelfth street, across the Blue River, between the Missouri Pacific and the Kansas City Railroad tracks. The buildings are to be fireproof, of steel and brick construction, will cover about five acres and the investment, it is said, will approximate one-half million dollars. It is hoped to have the plant in operation within six months and to employ about 500 men, which number may be increased to 1000 within a year. The location chosen affords excellent shipping facilities, and the factory is being erected to build boilers and radiators to supply the territory from the Mississippi River to Arizona, Colorado, Oklahoma, northern Texas and to the Dakotas. The present offices, in charge of M. J. Beirn, Jr., in Kansas City, are at 312 East Eighth street, that city.

A Newton Cylinder Boring Machine.

A new design of the No. 3 cylinder boring machine is now furnished by the Newton Machine Tool Works, Philadelphia, Pa. The spindle of this machine is 8 in. in diameter, and is driven by a sleeve which revolves in a bearing at each end of the head, having a length over all of 33 in. On the center of the spindle sleeve between the two end bearings is mounted the driving worm wheel, which has a cast iron center in a bronze ring, into which are cut 6-in. pitch, triple-lead teeth;

As shown, this machine is furnished, when desired, with a counterbalance to oppose the weight of the facing arms and insure a steady, even motion of the spindle when boring and facing at the same time. Where desired, the facing arm can remain stationary while the spindle rotates; the facing arms are furnished with swiveling tool holders, mounted on a slide having reversing power feed.

The particular machine illustrated in Fig. 1 is intended to be driven by a variable speed motor, belted to the single pulley shown, from which spur gears trans-

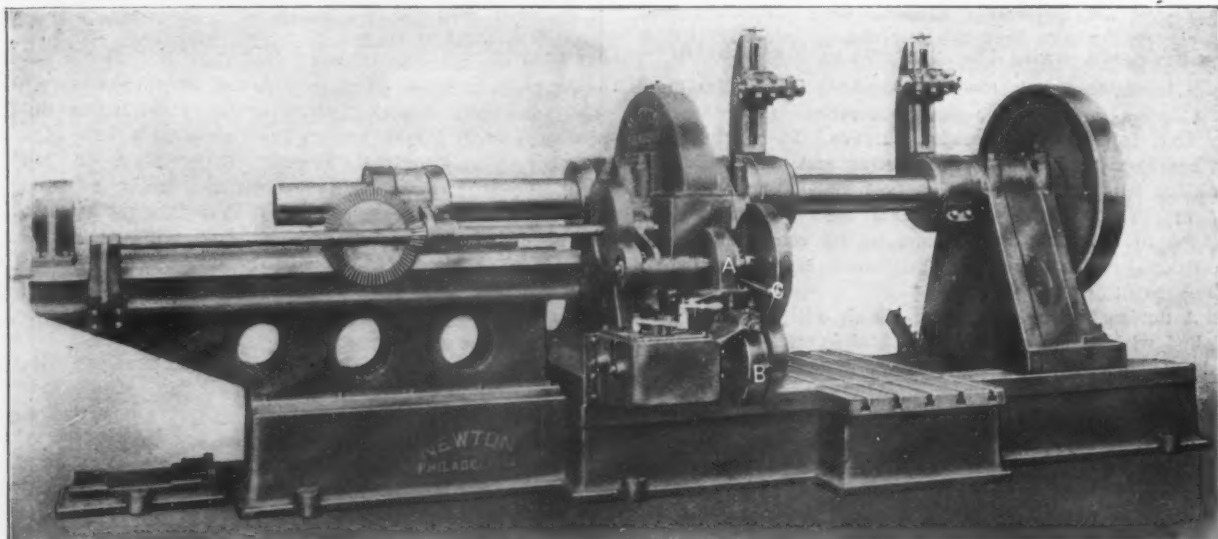


Fig. 1.—The New No. 3 Cylinder Boring Machine Built by the Newton Machine Tool Works, Philadelphia, Pa.

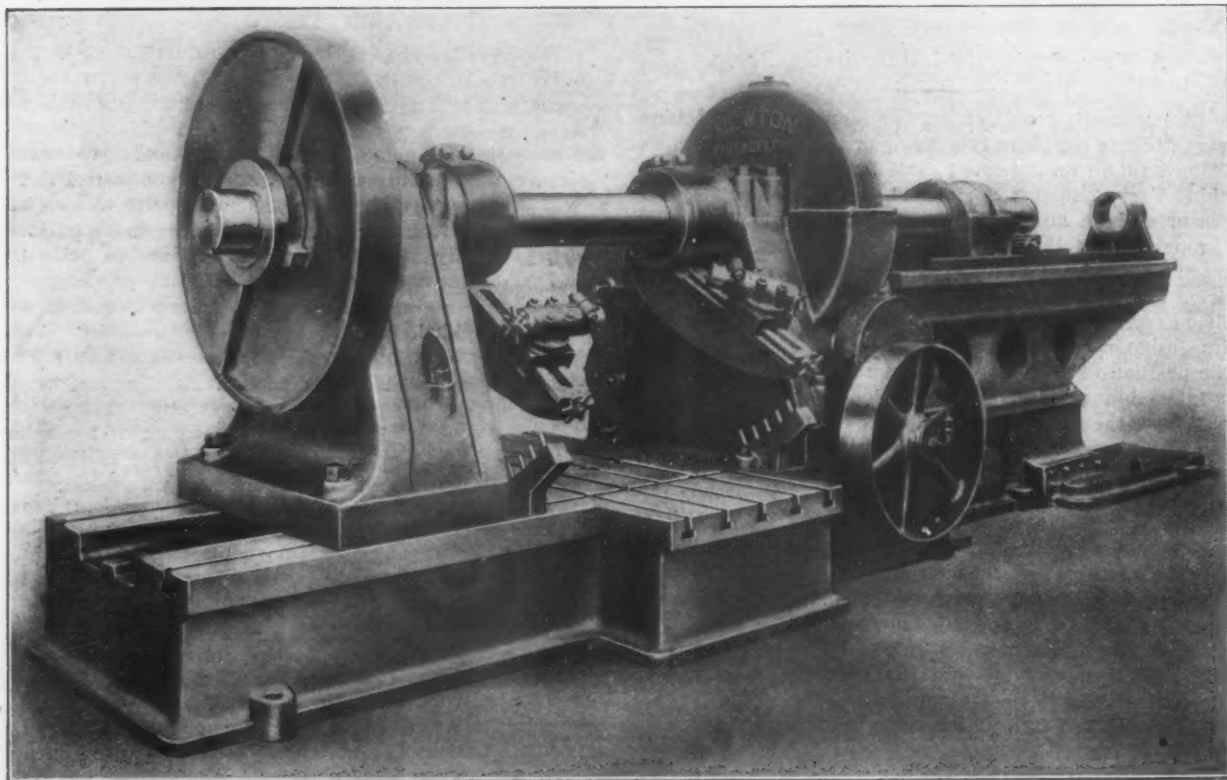


Fig. 2.—A Rear View of the Newton No. 3 Cylinder Boring Machine.

the driving worm is of hardened steel, with roller thrust bearings.

The outer end of the spindle is arranged to drive a spindle sleeve having a bearing of large diameter, about 20 in. long in the outboard head. The feed motion to the bar is transmitted by a trolley yoke, with which any number of grips on the bar may be taken; motion is transmitted to the trolley by two pinions meshing in racks on each bearing of the horn, as shown in Fig. 2. The facing arms are mounted on extensions of the spindle sleeves, permitting the adjustment of the spindle without removing the facing arms.

mit the motion to the driving worm. The motion for the feed is taken from the end of the driving worm shaft, as shown in Fig. 1, to the idler male friction gear at A for the fast traverse, and to the worm wheel at B for the feed. The worm wheel is mounted on the feed box shaft, which, through the different combinations, gives nine changes of gear feed. The hand lever C operates the friction clutch controlling the fast traverse of the spindle, and also the tooth clutch engaging the feed. With this design of drive and feed it is possible to obtain a great variation in the spindle speed, although the present machine is arranged for 3 to 9 rev. per min.

of the spindle, and feeds from 0.062 to 0.647 in. per revolution of the spindle.

The length of the feed is 72 in., the distance from the center of the spindle to the top of the work table is 37½ in., and the working surface of the table is 34 in. wide by 71 in. long. The machine has a capacity for boring cylinders up to 40 in. in diameter, and will bore and face up to 50 in. long. When motor driven this machine would require a 15-hp. motor, preferably with a 3 to 1 range of speeds.

Copper Clad Steel.

Its Properties and the Method of Manufacture.

BY W. MARSHALL PAGE.*

Many unsuccessful attempts have been made in this country and abroad to coat steel with copper. The failure of this copper covered steel was due to the fact that the copper was never welded to the steel, but merely had a close mechanical adhesion. As is well known steel brought into contact with copper is rapidly destroyed by corrosion; further, the expansions by heat of copper and steel are so totally dissimilar that even under ordinary conditions of temperature great strain would be developed at the line of juncture. Thus in these former attempts at producing copper covered steel, not only was hot or cold working of the metal very difficult and expensive, but when any actual samples were produced it was soon found that where corrosion did not cause rapid destruction of the steel the material itself rapidly crystallized.

To avoid these drawbacks copper clad steel is now manufactured with a linking alloy film between the two metals. A steel billet properly treated is immersed in a bath of specially prepared copper at so high a temperature that the surface of the billet is partially dissolved. This copper is so fluid that it readily impregnates the outer portion of the steel, and when the billet is withdrawn an alloy film of copper and iron is found on the surface. The billet is next placed in a mold, great care being exercised to prevent the destruction of the alloy film by oxidation, and a final coating of pure copper, which readily welds to the previously alloyed surface, is cast around it. In this way the two metals are so firmly united as to withstand sudden temperature changes, shock or stress.

The Effect of Copper-Iron Alloys.

A section placed in a vise and hit heavy blows with a hammer does not show any separation between the copper and steel. A sample of this clad metal may be heated to any temperature (below the melting point of copper) and plunged in ice water without in any way weakening the weld. In view of the difference in expansion between copper and steel and the force exerted by the heating and sudden chilling, this seems almost an impossibility; the explanation is found in the structure of the metal. Copper clad steel does not consist of a layer of copper and a layer of steel directly joined together, but of a layer of copper and a layer of steel permanently united through intervening alloys of copper and iron, ranging all the way from a high copper low iron alloy to a low copper high iron alloy.

As the alloy nearest the copper is high in copper its physical characteristics approximate those of copper, and it shades off to a low copper high iron alloy, which approximates the physical characteristics of the steel. As one of the functions of this series of alloys is to absorb the unequal expansion of the two metals, there is at no time any stress exerted at the weld line. This is particularly noticeable during the manufacturing process; for, although the copper is much softer than the steel core, both metals are equally extended during either the hot rolling or the cold drawing necessary to convert the material into wire.

Results of Corrosion Tests.

Corrosion tests have developed some remarkable facts. In a paper on copper clad steel printed in the *Journal of Industrial Chemistry*, in September, 1909, Mr. Tassin has shown that corrosion on the exposed ends of samples of copper clad steel practically ceases somewhere between 15 and 40 days. As is well known, although zinc is electro-positive to iron, zinc-iron alloys are electro-negative. Copper is electro-negative to iron, and when these two are brought in contact with each other, electrolysis rapidly develops. The iron-copper alloys, however, are electro-positive to the iron.

In view of this, further tests have developed the following phenomena: A small hole has been drilled through a sheet of copper clad steel and upon exposing the steel to corrosion it was found that at first the exposed portion of the steel core rusted at approximately the same rate at which under ordinary conditions unprotected steel would, but in the course of a few days this corrosion practically ceased. Rods of copper clad steel, the ends of which have been filed up square and exposed to corrosion tests, showed that only the steel in the center of the rod had been attacked, while that next to the alloy film was practically untouched, and, as stated by Mr. Tassin, this corrosion ceased at the end of 40 days, during which time it progressed but a short distance into the steel.

Mr. Tassin suggested in his paper that this cessation of corrosion might be due to the fact that after a certain amount of rust had formed a film of copper mixed with some copper oxide was plated out and deposited between the outer layer of the oxide and the unattacked steel, and that this might act as a preservative coat. That the corrosion ceases after a short period of time is certain, and the fact that there is no corrosion on that portion of the steel lying alongside the alloy film proves that this alloy is neutral to the iron.

Physical Characteristics.

The physical properties of this product are so varied and remarkable as to give rise to the opinion that commercially it is a new metal with certain definite physical characteristics which are not the mean of copper and steel. For example: The tensile strength of copper clad steel after the proper treatment, although 40 per cent. of its sectional area is copper, is equal to that of steel of similar composition to that in the clad material, but with a sectional area equal to that of the copper clad metal.

The elastic limit of copper clad steel will average 90 per cent. of its ultimate strength, while the elastic limit of copper is only 60 per cent. of its tensile strength. The elastic limit of steel is variable, but for the purpose of illustration let it be taken at 90 per cent. The elastic limit of copper clad steel is equal to that of a similar steel treated under like conditions, and yet in the clad metal only 60 per cent. of the total area is steel.

It is obvious, owing to its high tensile strength, that not only may a much smaller size of copper clad steel be substituted for copper, but as in contrast with steel the copper clad metal is noncorrosive, no large factor of safety to allow for subsequent deterioration by rusting need be employed.

Owing to the numerous failures of copper coated metals (so-called "copper-welded-to-steel") which have been put on the market, engineers have become more or less skeptical, and look upon any new article in this line with suspicion. That copper clad steel has passed the experimental stage has been fully demonstrated. In the past year several million pounds of this material have been sold, and in almost all cases it has been found to exceed in tensile strength the minimum claimed.

The Perry Iron Company, Erie, Pa., has foundations installed and will erect immediately a new stove, which will be in addition to the present equipment of 21 x 70 ft. McClure stoves. The additional stove will be of new type, with square checkers, as recently patented by A. C. Nelson, and is being erected under contract by Arthur G. McKee, engineer, Cleveland, Ohio.

* Duplex Metals Company, 149 Broadway, New York.

The S. E. Horton Lathe Chucks.

It is the fact that as more powerful lathes have been required and supplied since the improvement in tool steel, lathe chucks have not been correspondingly strengthened. As a result the working capacities of heavy duty lathes are principally limited now by the chucks. In other words, the latter are the present weak link in the train between the drive and the work. Realization of this situation is responsible for a new company with a new product, the S. E. Horton Machine Company, Windsor Locks, Conn., building a new line of four-jaw independent reversible jaw chucks. In their principle of action the chucks are not unlike familiar patterns of such chucks, but the details of construction are distinctive and have for their object increased strength. The jaws have broader faces and wider bearing surfaces

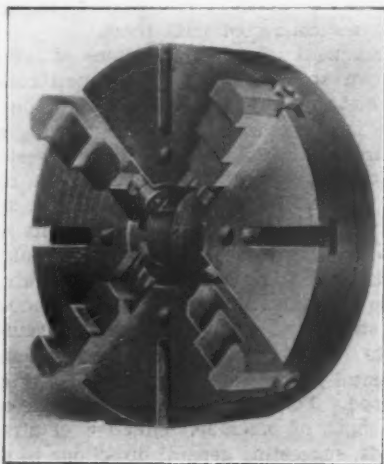


Fig. 1.—A 15-In. Chuck.

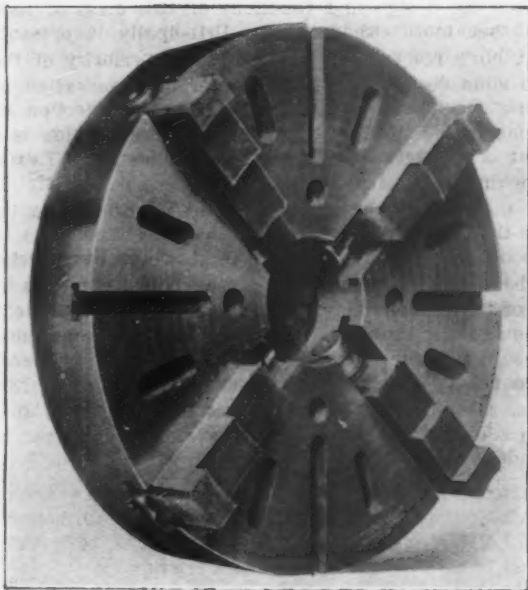


Fig. 2.—A 21-In. Chuck. Two Sizes of the Four-Jaw Independent Lathe Chuck Made by the S. E. Horton Machine Company, Windsor Locks, Conn.

than formerly, and the screws are unusually large in diameter, making them very strong and powerful. The driving power is applied close to the work as the screws are brought up nearly to the face of the chuck. Three bearings are provided for each screw, which insures long wearing qualities and correct alignment. The chucks are furnished with long handled powerful wrenches, and will stand up under the continued use of these wrenches. The jaws are reversible by simply running them out and turning them end for end. The independent control of the jaws makes it possible to handle a large variety of rough forgings, castings and pieces of irregular outline, and it permits as well of the truing up of finished work to run with any desired degree of accuracy. The makers of the chuck have behind them a long experience

as specialists in the chuck business, and have taken full cognizance of the special needs—strength, gripping power and durability—and realize that the latter depends not alone on workmanship, but also on correct proportions of bearing surfaces in relation to the strains imposed.

As has been suggested the improved proportions given the jaws and screws constitute the most striking feature of the new chuck. The jaws are fitted into the shell much more substantially than has been the custom. This is partly to be judged from the general views of two sizes of the chucks, a 15-in. and 21-in., shown in Figs. 1 and 2, respectively, but more apparent in the drawing given in Fig. 4. It will be seen how the resistance of the jaw to the lateral thrust imposed by the driving of the work has been increased by making the base of the jaw broader. Another advantage of this form of jaw is that it permits the use of unusually large diameter screws. For example, 10-in. chucks have screws $1\frac{1}{4}$ in. diameter, and 15-in. chucks $1\frac{1}{2}$ -in. screws, and the fact that the screws are brought up much nearer to the face lessens the tendency of the jaws to spring away from the work. Views of a jaw and screw for a 15-in. chuck are given in Fig. 3. The three bearings of the screws are all on turned diameters, no reliance being placed on the threaded surface as a journal. This greatly

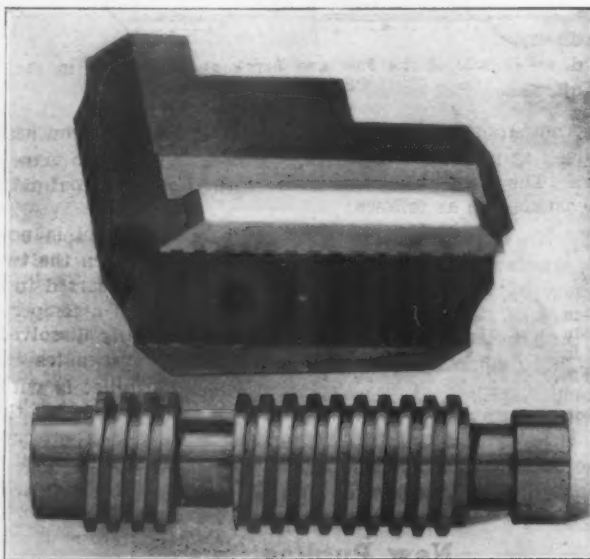


Fig. 3.—A Jaw and Screw of a 15-In. Chuck.

increases the durability at a point where durability is especially needed. The end thrust is divided between the inner and central bearings, which eliminates chance of the shell breaking out at the end of the jaw, as the end bearing is merely for support only. The socket for the wrench is formed in the stock of the full root diameter of the thread, thus giving the maximum size at this important point. As a result of the increase in strength and durability of the jaw and screw much heavier clamping strain can be exerted without danger of breaking or causing excessive wear. This permits the use of wrenches of greater leverage. The wrenches as regularly furnished are of such length that there is no need for applying pipes to their handles to increase the leverage.

The safe capacity of the chuck has been increased to considerably more than its outside diameter because the jaws are of sufficient length and the screws are threaded practically to the extreme outer end, making it allowable to run the jaws out of the chuck at least one-third of the length and still have ample thread contact with the screws for holding large work.

Another feature of the chuck is a larger hole through it than is usual; this is permitted by the increased width of the base of the jaw. This is of advantage in holding work having a large hub, or it may be utilized if desired in attaching the face plate the other end to from the usual position, thus greatly reducing the overhang and giving a corresponding advantage in the matter of stiffness. The distance from the face plate recess to the

face of the chuck is less than usual, this being obtained by having the screws brought up nearer the face of the chuck.

The shell is of wide and well ribbed proportions, no weight being added except where needed, but, on the other hand, not spared where it is necessary to make the body equal to the great strength of the jaws and screws. It is the builders' intention to keep within the most used range of sizes, and by so doing it is hoped to keep

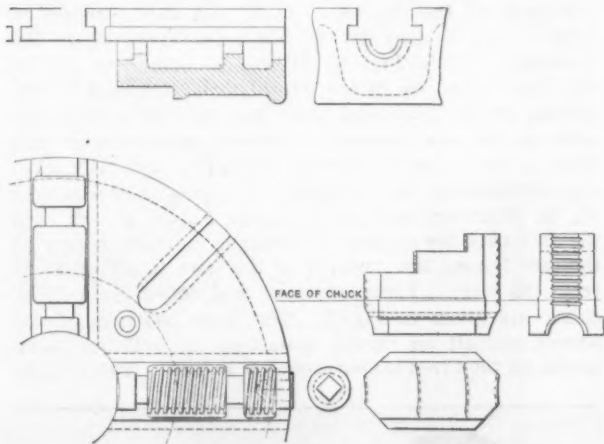


Fig. 4.—Details of the Jaw and Screw and Their Fit in the Chuck Body.

the manufacturing cost low enough to permit the chucks to sell at prices corresponding to those now on the market. The sizes at present built, with their principal dimensions, are as follows:

Size.	Maximum capacity of chuck.	Size hole through chuck.	Diameter of face of plate recess.	Approximate weight.
8-in.	8½	2¼	4¾	35
10-in.	11	2¾	6	50
12-in.	13	3¼	7 ¹ / ₁₆	70
15-in.	16½	4	7 ¹⁵ / ₁₆	110
18-in.	20	4¾	10	160
21-in.	23	5	10	220
25-in.	27	5¾	12	315

Sizes from 12 to 18 in., inclusive, have tee slots for the use of holding bolts when required. Sizes 20 in. and larger are provided with through slots, as well as tee slots.

New Publications.

Machine Building for Profit and the Flat Turret Lathe.

By James Hartness, president of the Jones & Lamson Machine Company, Springfield, Vt. Size, 6 x 9 in.; pages, 253; illustrated. Cloth binding. The book is not for sale, but is distributed gratis to responsible people that will appreciate its value.

The publications that have been issued by this company for a number of years, if they could be called catalogues at all, were decidedly above the standard, not alone in make-up and appearance, but in the nature of their contents, and now the company has issued a publication even superior to all of its previous attempts. So important did it appear to the editor, that it was decided that it deserved review in this column. The second section of the book may perhaps be considered a catalogue, inasmuch as it is a description of the Hartness flat turret lathe, but it is so much more complete in the account it gives of the construction, operation and uses of the machine, the reasons for and the advantages of various features of the construction, the evolution of the machine from its earliest pattern, and the large number of illustrations accompanying the text, that it is quite as interesting to read as the first section, particularly to those concerned with the use of turret lathes.

It is the first section, however, headed "Machine Building for Profit," that will appeal to the manufacturer. It is a philosophical analysis of the business of building machine tools. An introductory chapter calls attention to a few well-known principles of psychology applicable to the discussion, calculated to prepare the reader's mind to receive the arguments which follow. These bear on such points as protecting the money in-

vested; the value of specialization; selection, education and disposition of the working force; necessity of the combined efforts of inventor, officers, foremen and workmen to produce the best machine, in other words, the value of a good organization; necessity of salesmen's confidence in their wares, and selection of equipment. The last named theme is elaborated with special reference to the limitations of the standard engine lathe on the one hand and the automatic turret lathe on the other. All of these topics and others, including purchase of raw material, amount of stock in store and passing through the plant and the influence of the latter on the profit, are treated with a keen appreciation of the balance of things, but with one fundamental purpose underlying it all—economy. The especial value of this part of the text is that it directs thought to so many points that are often overlooked. It is our very familiarity with things that sometimes causes us to lose sight of important elements or phases connected with them.

The author next takes up principles of lathe design, giving first an apt summary of the qualifications that should be met by any machine tool. "The machine should have the greatest efficiency in turning out work when measured by the output per dollar invested in the machine. It should produce the work at a reasonably low labor cost (but under no pretext should a machine be used that throttles the output or effects its savings in labor at the greater loss of profit). It should be conveniently adaptable to present and probable future needs. It should be conveniently operable. Its product should be true in shape and size. It should conveniently set for duplicate work." There follows an explanation of the fundamental purpose of a lathe and how this tool has been developed. This chapter takes up such considerations as strength of machine, reduction of stresses and cutting speeds, suggesting general directions in which improvement may be looked for.

Turret lathe design, the next chapter similarly analyzes the design and functions of this class of tool, but rather more exhaustively. Principally it presents the author's reasons for belief in the superiority of the single slide design. A short chapter on observation of running machines is suggestive of proper selection of equipment, and the last chapter in the first section is a reprint of extracts from a previous publication, "Evolution of the Machine Shop."

If there is anything the reviewer might add to interest the designer, builder or user of machine tools in this book he would gladly do it, for however commercial may be the ultimate purpose of the book, and even if some of its opinions may admit of dispute, its treatment is unique along its lines, there being nothing comparable to it, so far as the writer is aware, at present published. Where other works on machine tools are mainly historical, reporting what has been or is being done, this one in addition is somewhat prophetic of progress yet to be made.

Technisches Auskunftsbuch for the Year 1910.—Seventeenth annual edition. By Hubert Joly. Cloth bound; 1435 LVIII pages, 5 x 7¼ in. Illustrations, 147. Published by K. F. Koehler, Leipzig, Germany.

This German technical handbook for 1910, like its predecessors, contains a vast amount of memoranda, tables, rules, formulae, prices and data on sources of supply of materials and machinery in construction and engineering lines.

The demand for competent teachers of industrial arts has led Teachers College, Columbia University, New York, to plan a series of night courses, by which young men who have a first rate technical ability in the trades, such as woodworking or machine shop work, can prepare themselves for the profession of teaching. These courses are being offered at night in the School of Industrial Arts of Teachers College, covering mathematics, drafting, design, woodworking, machine shop work, industrial chemistry, industrial history and methods of teaching industrial arts. A three years' course of night work will enable an expert mechanic, otherwise qualified, to gain a diploma as teacher of industrial arts.

The Latest Gang Radial Drilling and Tapping Machine.

The novel features of the latest type of radial drilling and tapping machine, Fig. 1, manufactured by the William E. Gang Company, Cincinnati, Ohio, are embodied in the head in which the spindle is driven by friction clutches, making it possible to drive large pipe taps, and back them out by reversing the spindle while under strain. As the back gears are placed between these friction clutches and the spindle, it is only necessary for them to pull about one-fifth the power required at the spindle.

The construction and operation is made clear in the line drawing, Fig. 2, showing the gears and the manner of driving. The power is transmitted from the column to the head through the shaft *a*. The bevel pinion *b* meshes with the bevel gears *c* and *d*, which run loosely on the shaft, and are fitted with friction rings. The sliding member *e* of the friction clutch connects either bevel gear *c* or *d* through the rings with the shaft *f*, causing the spindle to run forward or backward. The spur gear *g* is a part of the shaft *f* and meshes with the gear *h*, which runs loosely on the sleeve *l*. The spur

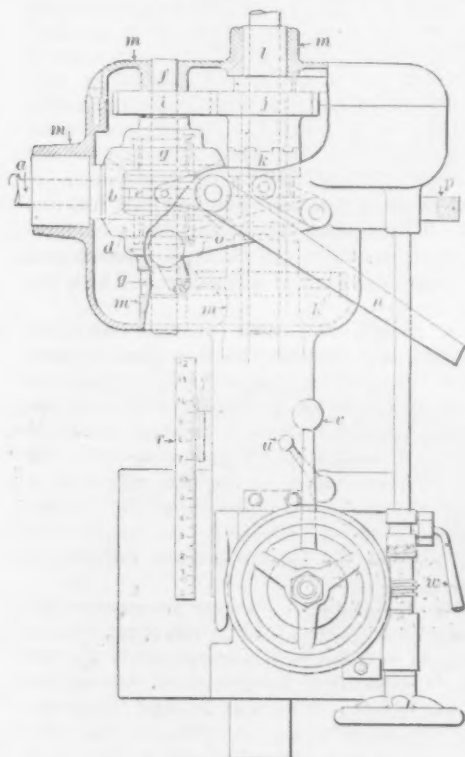


Fig. 2.—Details of the Drive of the Gang Drilling and Tapping Machine.

gear *i* is keyed to the shaft *f* and meshes with the gear *j*, which is also loose on the sleeve *l*. The gears *j* and *h* have jaw clutches on their hubs to engage with the sliding clutch *k*, which is keyed to the sleeve *l*. The steel sleeve *l* is interposed between the spindle and the positive clutch *k*, and is keyed to each so that no strain comes upon the spindle, and there is no tendency to disengage the clutches when the spindle travels up or down under strain. The clutch *k* is used only when changing from the high to the low speed, which with the cone pulley drive gives 8 speeds at the spindle or 12 speeds with the speed box. The friction clutch *e* operated by the long lever *n* at the right of the head is used to start, stop or reverse the spindle, and operates without shock or jar. At *m* is shown where the shafts and spindle are journaled in the head. The back gear lever *o* operates the clutch *k*.

The depth gauge *r* and the automatic stop for the spindle are radical departures from the ordinary variety in that the graduated scale, instead of being on the spindle and moving with it, is stationary and attached on the head. The tripping dog and pointer *s* is adjustable

vertically and clamped in position by a bolt working in a tee slot in the spindle sleeve. The point to be emphasized in connection with this arrangement is that the zero point being at the lower end of the graduated scale and in a fixed position, all that the operator has to do in preparing to drill or counterbore a hole to a given depth, is to bring the drill or counterbore down on the surface of the work, loosen the binder on the tripping dog, set the pointer opposite the correct graduation on the scale, tighten the binder and start the feed. When the pointer gets to zero, the feed will be knocked out automatically, and the spindle can travel no farther. All depths are read from zero.

Four rates of feed are provided on this machine—0.008, 0.011, 0.014 and 0.017 in. per revolution of the

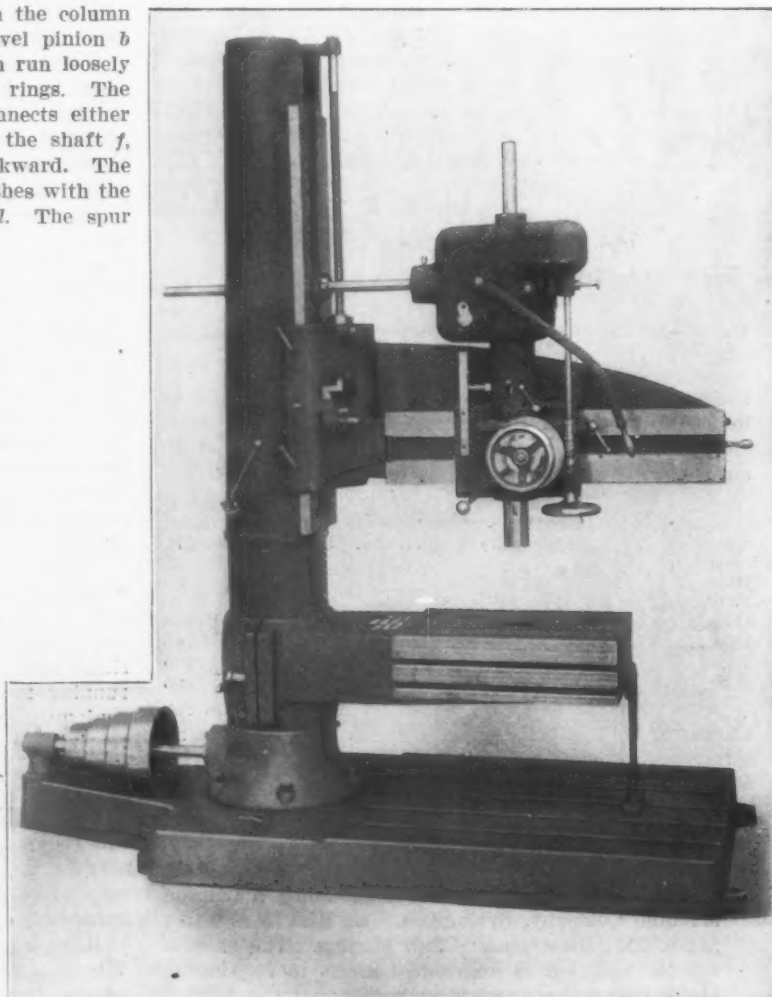


Fig. 1.—The New Radial Drilling and Tapping Machine Built by the William E. Gang Company, Cincinnati, Ohio.

spindle, secured by turning the knurled knob *p*. The power feed is taken from the upper part of the spindle through a train of spur gears to the shaft shown at the right of the head, all held in the upper part of the head the same as the driving gears, then through the worm and worm gear to the spindle. The worm gear drives the spindle rack pinion through a friction clutch operated by the quick return lever *v*. The lever *w* operates a saw-tooth clutch, which can be disengaged when desired to use the hand feed.

The head is gibbed and is adjusted on the radial arm by a rack and pinion, actuated by a hand wheel, and can be securely locked in position by a binder screw and lever *u*. A speed box can be applied to this machine, and the following tables can be furnished: Plain square, round, plain swiveling, round tilting, square box and square tilting box.

The company's usual practice of inclosing all gearing has been incorporated in this machine, thereby protecting the operator as well as the gears from injury, and minimizing the number of bolted-on bearings. Neatness and simplicity of design are thus secured.

Gary's Great Future.

The New Industries Now Locating in the Indiana Steel City.

It is estimated that the new industries which have been definitely located at Gary will employ more than 50,000 men and support a city of perhaps 200,000 people when they are fully developed. The American Bridge Company, American Sheet & Tin Plate Company, American Steel & Wire Company, American Locomotive Company and American Car & Foundry Company have all purchased sites from the Gary Land Company for plants which will surround the steel works, radiating like the spokes of a wheel from the source of supply of their raw material.

The American Bridge Company has begun the construction of buildings on its location of about 100 acres, the administrative building being already under way. It is estimated that this company will employ 4000 men when the plant is completed and will have an output of 20,000 tons a month of fabricated material.

The American Car & Foundry Company will have a mammoth plant covering 200 acres. It is estimated that this company will employ 12,000 men, and will turn out 200 cars a day, making a yearly production that will be equal in freight-carrying capacity to the annual loss of cars on all the railroads of the United States. To make 200 cars a day this plant would require probably 3000 tons of steel daily, which is more than the present output of the steel plant, and nearly half of the capacity of the steel works on the basis of eight blast furnaces.

The American Locomotive Company will erect a plant covering 130 acres. The plans under consideration when this site was chosen contemplated the production of 50 locomotives per month, employing about 4500 men, but it is now understood that the plant will be three times as large as originally contemplated, and will employ 12,000 men and turn out 150 locomotives per month, or 1800 in a year. On the basis outlined this company would have the capacity to supply locomotives for all the railroads west of Chicago, equal to about half the annual production of the United States.

The American Sheet & Tin Plate Company will have a very large plant covering about 200 acres on the lake shore, and it can add 100 acres to its site for future expansion by filling in and extending the shore line.

The American Steel & Wire Company has 60 acres adjoining the steel plant, but this will be increased to 120 acres or more when the work of extending the shore line, which is now in progress, is completed. It is understood that this plant will have its own rod mills and will manufacture a full line of wire products.

The Indiana Steel Company now has 5000 men on its payroll, and it is estimated that 12,000 to 15,000 will be employed when the eight blast furnaces and all the finishing departments are in operation. The steel plant occupies about 1000 acres out of the 9000 originally owned by the Gary Land Company. Until recently the company has had only four furnaces in blast, and its output of rails and billets in October was about 70,000 tons. Two more blast furnaces are now coming in, with corresponding open hearth furnaces, and the production for December should be over 100,000 tons of rails and billets. This plant is now operated under lease by the Illinois Steel Company, and its output of 100,000 tons per month added to the 200,000 tons made by the old mills of that company will make a total production of 300,000 tons or more monthly for the Illinois Steel Company.

Even with this large addition to the supply of steel in the Chicago District the demand cannot be satisfied, and the billets that have been available from the Gary mill have not covered the needs of the various finishing departments, leaving many of them short of steel under the extraordinary conditions which are crowding all the finishing mills to their full capacity. The bar mills at Gary are about ready for operation and one of the smaller plate mills will soon be ready, so that the finishing departments there will probably need steel as

fast as the production of the steel works can be augmented.

It is becoming evident that the Gary plant will be wholly inadequate, on the basis now nearing completion, to take care of the enormous demand that has grown up in the Mississippi Valley. With eight furnaces in blast (six now completed and two more now nearing completion) the output of rails, bars, structural shapes, plates, axles and other products for sale to the public will not much exceed 2,000,000 tons, if it reaches that figure. This will be swallowed up by the current demand from the Mississippi Valley and the West, and will not leave any provision for the enormous car building shops and other industries which are under way. Western railroads want steel cars, and at least 1,000,000 tons of plates and other steel will be needed annually to meet this new demand. The existing structural mills are so far behind they are almost out of sight of the enormous demand that has sprung up within the last year in the Mississippi Valley for steel office buildings and hotels and other fireproof structures. It is believed among those who are watching developments in this quarter that if the Gary plant were expanded to the basis of 16 blast furnaces it would scarcely cover the business that will be naturally tributary to Chicago.

Recently a Chicago buyer had to beg for two billets. By unfolding a tale of woe and the fact that he was a very old customer he succeeded in getting them, practically as a personal favor. This incident shows how carefully the existing mills have to guard their supply of steel to make it go round and cover the consumptive demands on the various finishing departments.

A New Steel Foundry for California.

The Columbia Steel Company, Portland, Ore., has under way the construction of a new plant which will be located in the vicinity of Black Diamond, Contra Costa County, Cal. On October 1 the articles of incorporation were filed in Nevada and bore the signatures of Charles M. Gunn, C. S. Cole, C. A. Hooper, C. G. Dall, A. M. Kidd, Sumner Crosby and W. E. Creed. The company is incorporated for \$500,000. The Columbia Steel Company's plant at Portland has been under the active management of Charles M. Gunn for several years. He is president of the new company and C. S. Cole is secretary and treasurer. The San Francisco offices are located on the eighth floor of the Hooker & Lent Building, 503 Market street.

Both the open hearth and converter processes of making steel castings will be followed at the Black Diamond plant. The main building will approximately be 130 x 200 ft. When in operation the new plant will be under the personal supervision of Charles S. Cole, formerly of the American Radiator Company, Detroit. Mr. Gunn, the president of the new company, was connected with the Union Iron Works for 18 years. While in Oregon Mr. Gunn became actively engaged in the association movement and was the first to hold the office of secretary-treasurer to the United Metal Trades Association.

The Cyclops Foundry Company.—As mentioned in *The Iron Age* of November 18, page 1548, the Cyclops Foundry Company, recently organized, and with offices in the Union Bank Building, Pittsburgh, has purchased the long idle plant of the Monongahela Casting Company, located at Monongahela, Pa., on the Monongahela Division of the Pennsylvania Railroad. The machine shop equipment is entirely new. The foundry equipment includes a Whiting cupola, overhead cranes and eight molding machines, four of which are of special design, capable of producing machine-molded castings up to 500 lb. in weight, in addition to ordinary work up to 20,000 lb. The company proposes to do a regular foundry business and will make a specialty of machine-molded castings. Pipe balls for tubular mill operations as well as a general line of iron castings will be manufactured. The officers of the new company are as follows: President, Henry Chalfant; vice-president, Hugh H. Davis; secretary and treasurer, W. C. Heath.

The Reynolds Radial Screw Driving Machine.

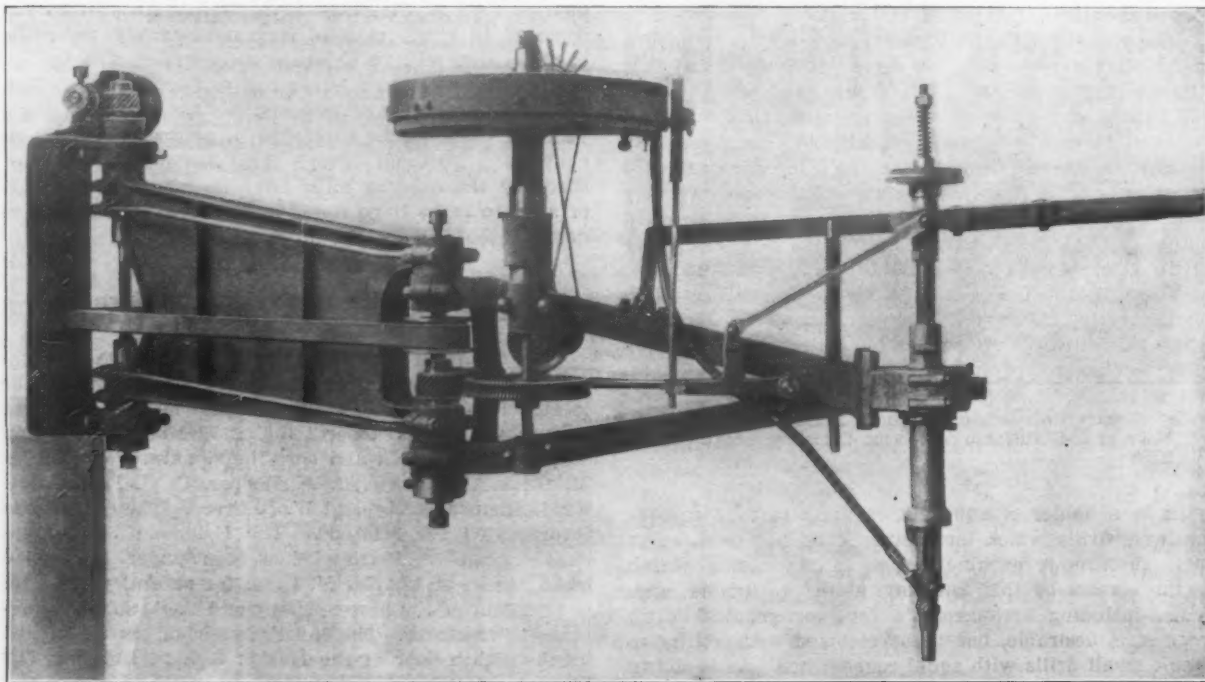
A screw-driving machine that bears the same relation to the regular or upright type that a radial drill does to an upright drill press is the latest addition to the line made by the Reynolds Machine Company, Moline, Ill. It drives either wood or machine screws and covers a range of work for which the regular stationary type was not available.

The working parts of the machine are mounted on a jointed arm, the rear end of which is pivoted in a casting which is secured to a post or to the wall of the building in which the machine is to be used. The arm is of such length that the screw-driving spindle is 7 ft. from the post, and, as the arm may be swung around as a whole, or swung around the joint in its center, all of a 14-ft. semicircle can be covered except a small space close to the post. The size illustrated is capable of driving screws up to No. 20 4 in. long. It is operated by a lever long enough so that ample pressure can be brought on the spindle to hold the screw-driving bit on

there is ample power to drive the largest screws anywhere they can be driven by any other means, and in many cases screws can be set without boring for them where otherwise it would be impossible. The machine is stronger than the screw, and will drive it anywhere it will stand to be driven. It is adapted to be driven either from a line shaft, countershaft or by motor.

Freight Rate Changes.

A material reduction in freight rates on wrought iron and steel pipe and fittings from Pittsburgh territory to Texas common points and to those cities where the freight rate is based upon common points will go into effect December 7. The present rate per 100 lb. is 67c., and this will be reduced to 62½c. A similar reduction of 4½ cents to 58 cents will be made February 7. The present rate to Houston and Galveston per 100 lb. in carload lots is 53 cents, which will be reduced December 7 by 3 cents to 50 cents, and again on February 7 by 4½ cents to 45½ cents. After the reduction of February 7



A Radial Arm Machine for Driving Wood or Machine Screws, Built by the Reynolds Machine Company, Moline, Ill.

the screw without undue exertion on the part of the operator.

The magazine, frictionally driven spindle, chuck, &c., are the same as have been used on the stationary type of machines, such as were described in *The Iron Age* July 9, 1908, and January 21, 1909. The spindle is spring counterbalanced, so that it is automatically raised when the operating lever is released. In operation the screws are simply thrown into the pan or hopper in bulk, and are there automatically righted and delivered through a tube to the lower end of the spindle, where they are held, one at a time, by spring-actuated jaws that automatically release when the screw is driven. The work having been placed where the spindle may reach the points where it is desired to drive screws, the operator holding the lever in one hand and placing the other on the head of the machine, so as to be able to swing it quickly in the desired position, operates the machine by depressing the hand lever as it comes into position. When the screw is home the friction drive of the spindle slips and the driver stops, so that neither the work nor the head of the screw is marred. Raising the lever allows a new screw to fall into position for driving.

The spindle runs at about 800 rev. per min., so that screws are set practically instantly, and as the machine is easily moved into position several times as much work can be done as by any other means. The machine is built to deliver 3 hp., if necessary, to the spindle, so

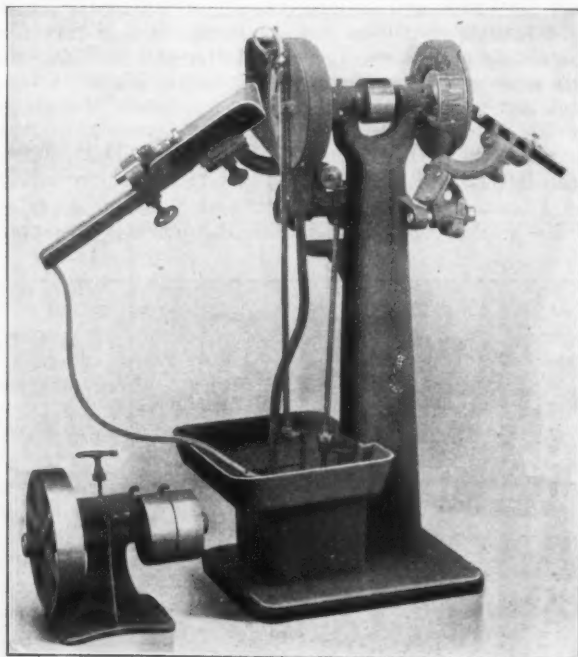
the all rail rate to Texas common points will be the same as the present rail and water rate. There will still be some slight difference, however, between the all rail and the rail and water rates to other shipping destinations based upon the common points. The purpose of the revisions is to more nearly equalize the all rail and the rail and water rate.

At a recent meeting of the Southern Classification Committee held in Louisville, a rule was made that all shipments of stoves and ranges must on and after January 1, 1910, take one of two classes, that is, if not crated to be in the second class, and if crated to be in the third class. At present uncrated stoves go as third class and when crated as fourth class. The new ruling will materially increase the rate on stoves. The State Railroad Commission has been asked by Louisville merchants to disapprove of it.

The New Haven Iron & Steel Company, New Haven, Conn., requests a denial of the report current in the daily press that the company is rolling structural material. Not a pound of this has been manufactured. Open hearth steel billets purchased outside of the plant are being rolled into rounds, flats and squares in the same sizes as always, and refined iron is being furnished in the smaller sizes, namely, rounds and squares from ¼ in. to 5/8 in., inclusive, and flats under 1½ in. width.

A Double New Yankee Drill Grinder.

Attention to the criticisms and suggestions of users is the surest and quickest way for manufacturers to develop their products to the point where they are fully as satisfactory and useful as possible. The Wilmarth & Morman Company, Grand Rapids, Mich., have done so with regard to their New Yankee drill grinder. What is reported as the only complaint that has ever been made of its construction is that it is difficult to handle small



A New Yankee Drill Grinder for Both Large and Small Drills, Made by the Wilmarth & Morman Company, Grand Rapids, Mich.

drills in a holder of sufficient capacity to take care of the large drills which most every shop has occasion to use. In a new machine, which is now being placed on the market by this company, ability to handle large drills, including arrangements for wet grinding them when it is desirable, has been combined with ability to handle small drills with equal convenience. As is shown in the illustration, this extended range of utility is effected by providing practically two grinders in one, with wheels and holders suited to the two classes of requirements.

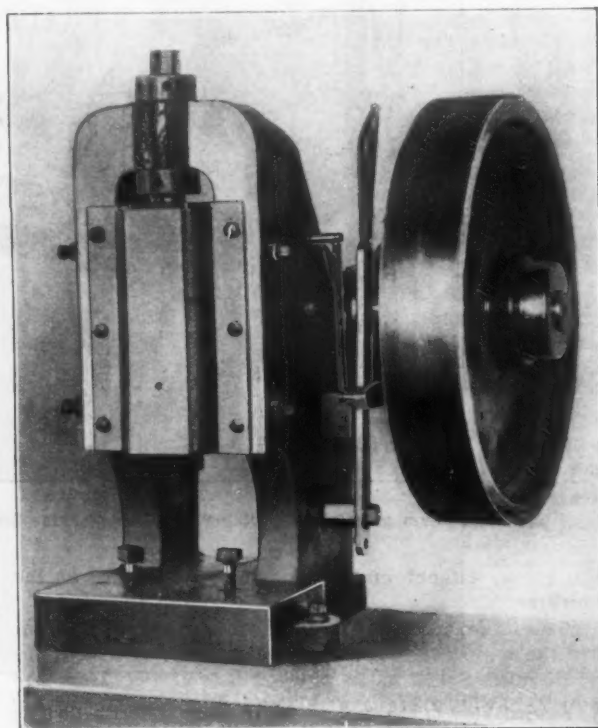
The large holder shown at the left is for wet grinding large drills, and has a normal capacity of $2\frac{1}{4}$ in. maximum, with a minimum of $\frac{1}{2}$ in. On account of the greatly increased convenience, however, it is expected drills of $\frac{1}{2}$ in. and under will be ground in the small holder at the right, which has a maximum capacity of $\frac{3}{8}$ in., and a minimum of No. 60 drills. A fine grain emery wheel is provided for the small drills. An advantage of the double equipment is that two operators can be working at the different holders at the same time without interfering with each other. Both holders embody the well known New Yankee construction, by means of which time consuming preliminary adjustments are avoided on account of the peculiar angle of the V-shaped trough automatically locating each different size drill in the right position for grinding.

As is usual with New Yankee drill grinders, the clearance can be adjusted when it is necessary, providing for, first, the small amount of clearance desirable for working in hard steel, and then the much greater clearance necessary for soft metal. The normal clearance, however, is continuously maintained for drills of various size without any thought or adjustment on the part of the operator. Only one or at most two adjustments are required, and it is practically only necessary to drop the drill into the holder and grind it. The machine illustrated is of the capacity before mentioned and is known as the style WPL.

A New Style Atlas Bench Press.

For punching and light stamping and for other purposes where a uniform pressure is required, the Atlas Machine Company, Waterbury, Conn., is offering a new style of bench press. It is particularly suited to the embossing work of jewelry and buckle manufacturers. By the use of power the objection to the foot press is overcome, that the operator cannot always exert an even pressure, hence cannot produce uniform work. The scope is that of the heaviest knuckle joint foot presses and of the light drop hammers. The machine can be run at a medium speed, and is provided with a one revolution clutch mechanism by which only one stroke of the gate can be made for each depression of the foot treadle. The bed is large enough to permit using various feeding and other attachments. The machine can be mounted on a work bench or on a cast iron table.

The operation of the press is controlled through a foot treadle connected with the vertical lever shown in the engraving, in conjunction with a horizontal clutch lever located close to the heavy driving pulley. The latter lever has a square pin which engages with a notch in the vertical lever when the treadle is depressed. This action draws down the clutch lever until it clears the driving key, which is then free to engage with the wheel, and the shaft begins to revolve. As it continues its motion a knock-off piece fastened to it causes the treadle lever to swing upon its stud, releasing the clutch lever,



A Power Punching and Light Stamping Bench Press Built by the Atlas Machine Company, Waterbury, Conn.

which is brought back to its original position by a spring in ample time to stop the press on the completion of a revolution.

The press has a stroke of gate to suit work up to $2\frac{1}{4}$ in. high. The distance from the top of the bed to the lower end of the ways is 6 in., the bed surface is $7\frac{1}{2} \times 12$ in., and the distance from the center of the gate to the upright is 3 in. The wheel has a 3-in. face and is 18 in. in diameter and weighs 100 lb. The total weight of the press complete is 500 lb.

The American Roll & Foundry Company, Canton, Ohio, is working on an important contract from the Massillon Rolling Mill Company, Massillon, Ohio, which provides for four 26-in. sheet mills and one stand of 27-in. pinions. The Massillon Company now has a plant of five mills, so that the extensions will mean virtually doubling the present capacity.

The Hill Anthracite Gas Producer.

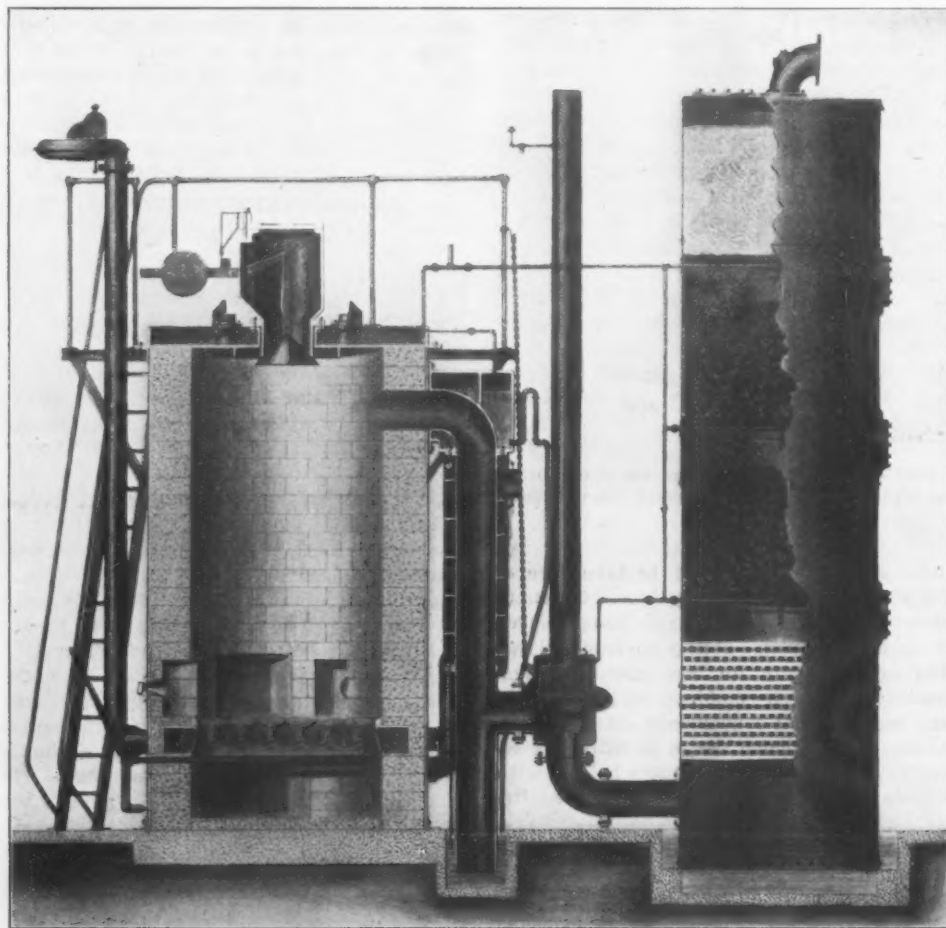
To be fairly reliable and highly efficient an anthracite producer gas plant should burn completely all fuel fired; generate a uniform quality of gas; furnish gas free from dust, tar, sulphur, &c.; cool and clean the gas with a minimum amount of water; respond automatically to varying conditions of load; be capable of operation with ordinary labor; return to the generator as nearly as possible all the heat abstracted in the cleaning and cooling of the gas, and be substantially and simply constructed to insure a low cost of maintenance. Arguing that producers designed and built abroad have approached most nearly to this ideal, but that they are impracticable for use in this country on the entirely different class and character of fuel obtainable, the Hill-Hupfel Engineering Company, 30 Church street, New York City, has developed an apparatus which it believes com-

charcoal, but usually pea anthracite or No. 1 buckwheat is used on account of its lower cost.

As is common in any other apparatus of its kind, the Hill anthracite producer gas plant consists of a generator in which the gas is made, an economizer in which the waste heat of the gas is utilized, a wet scrubber in which the gas is cooled and practically cleaned and a dry scrubber in which the gas is dried, and where it is thoroughly cleaned from any particles of dust and the moisture completely removed. These with their inter-pipe connections form the complete gas making apparatus. For industrial purposes an exhaustor is usually furnished to deliver the gas to the various furnaces under pressure, but where the gas is used in an engine the exhaustor is unnecessary.

The Generator.

The generator has a steel shell usually $\frac{3}{4}$ in. thick, cylindrical in form and lined with fire brick. Between



Sectional View of the Anthracite Producer Gas Plant Built by the Hill-Hupfel Engineering Company, New York, Showing the Generator, Economizer, Hydraulic Valve to the Purge Stack and the Wet Scrubber.

bins all of the above necessary essentials, and has a high efficiency, regulates automatically and is capable of being operated by ordinary unskilled labor, making the plant thoroughly commercial. The following features are emphasized as important for the reasons given: the thickness of the steel shells of the generators and their heavy lining, minimizing radiation loss; the large grate area in the shaking grates, permitting heavy overload capacity; the even distribution of air and steam through the circular and central tuyeres, insuring complete conversion of the fuel at uniform internal temperature; the use of preheated air and superheated steam, producing maximum economy and automatic regulation; the water-sealed hydraulic valve, complying with the insurance laws; the large scrubber capacity, which means clean gas and low velocities of the gas, and the design of the inter-piping, which permits free access for cleaning. There being no moving parts in the auxiliary apparatus it may be operated continuously, and a substantial construction promises little expense for repairs. The producers are built for anthracite coal, coke or

the shell and the fire brick is a layer of mineral wool to take up the expansion or contraction. In the smaller producers tight bottoms are furnished. In all types the top is water cooled. The shells are riveted and calked and each generator is provided with a shaking grate operated by a lever on the outside of the generator shell. Above and below the grate are two cleaning doors of heavy cast iron provided with a clamp for locking them. Below the grate is a circular cast iron tuyere, through which the air and steam are admitted. In addition to the latter there is an auxiliary tuyere below the grate and in the center of the producer. These two tuyeres provide a uniform distribution of air and steam throughout the fuel bed.

Side and top poke holes are provided for poking and stoking. The shaking grate permits the ashes to be removed while the producer is in operation without loss of fuel. The hopper is of the self-locking type, making it impossible to dump while the top is open. The top of the producer is water cooled, the cooling water being used in the economizer. The generators are rated on

a basis of burning 10 lb. of fuel per square foot of grate area. The outlet from the generator to the economizer is large, permitting the gases to travel at a low velocity, thus preventing dust from being carried over into the economizer. This greatly reduces the water required for cleaning the gas.

The Economizer.

The economizer is of cast iron, at the top of which is a water compartment provided with a sub-dividing wall extending to within 2 in. of the bottom. The water from the top of the generator is admitted into one side of the economizer head, and is maintained at a constant level by a U-bend regulator, which can be adjusted for any water height depending on the class and quality of the fuel being gasified. The inner chamber of the economizer head has two connecting pipes to the economizer proper. The water in the top of the generator is usually heated to 140 degrees F., and, passing to the economizer head, the temperature is increased to approximately 200 degrees F.

The center of the economizer consists of an iron casting provided with projections in the form of a spiral. The hot water trickling down this spiral is flashed into steam. As the bottom of the economizer is connected to tuyeres in the generator the suction of the producer forms a partial vacuum in the closed compartment of the economizer head, thus raising the water level in direct proportion to the load. Therefore, any variation in the load causes a corresponding variation in suction, and draws water into the economizer in direct proportion to the load on the generator. The air is admitted into the outer shell of the economizer through a door with an adjustable weight, and is mixed with the steam and drawn into the tuyeres by the suction on the generator. Between the economizer and the tuyeres are two adjustable dampers, so that a uniform amount of air and steam is admitted to the generator through the fuel bed. At the bottom of the economizer is a cast iron pipe extending into a water-sealed pit, which acts as a flash door in case of slight explosion.

Between the economizer and the scrubber a hydraulic valve is located, which is water sealed continually and, it is claimed, will not warp, crack or get out of order, as is the tendency with an ordinary gate valve. This valve is arranged so that it may be operated from either the charging platform or the producer floor, and is of the three-way type. When it is raised the gas passes from the economizer to the scrubber, and when it is lowered the gas passes from the economizer to the purge stack.

The Wet Scrubber.

In the wet scrubber the gas is cooled and cleaned. The scrubber has a steel shell, cylindrical in shape and of ¼-in. material, riveted and calked. These scrubbers are water sealed and are set in a concrete pit, from which an overflow is connected to the sewer. The scrubbers are provided with three sections. The lower one is filled with wooden checkers and the upper ones with broken coke. Large cast iron clean-out doors are provided in each section. Above each section water sprinklers are provided. In the small plants the wet scrubber is combined with the dry scrubber, and in the large plants the wet scrubber is provided with duplicate water piping to insure constant operation. These scrubbers are liberally designed, of large proportions, allowing the gas to pass through at a low velocity, insuring a thorough cooling and cleaning, and preventing excess of water being carried over to the dry scrubber. Under ordinary conditions the scrubbers require from 2½ to 2¾ gal. of water per producer horsepower per hour when the producer is operating at full load. The gas is cooled to within a few degrees of the temperature of the cooling water.

The Dry Scrubber.

In the dry scrubber (not shown in the illustration) the gas is thoroughly dried and all dust is removed. The dry scrubber is made of ¼-in. steel and is provided with two baffle plates with a filling of excelsior between, the top of which is soaked in oil. A large manhole is provided for cleaning out. Connections are made from

the dry scrubber to the pit of the wet scrubber for draining all entrained moisture. Owing to the large size of the dry scrubber the velocity of the gas passing through it is less than 20 ft. per second.

All piping used to connect the apparatus is extra heavy wrought iron, with standard Crane flanges and fittings. All gas connections are tees, one side blank, allowing easy access when necessary.

With one of these producers operating on buckwheat coal the distribution of losses is said to be as follows: In the generator by radiation, 5.8 per cent.; in the generator internally, 5 per cent.; in ashes, 2.2 per cent.; in the economizer, 4 per cent.; in the wet scrubber, 7 per cent.; in the piping, 3 per cent.; total, 27 per cent. Since 3 per cent. is recovered by the economizer the net loss is 24 per cent.; or the final efficiency, 76 per cent. Using clean anthracite coal having a heating value of 13,500 B.t.u. per pound, the internal losses decrease, and an efficiency of 80 per cent. is guaranteed at full load. The company is prepared to furnish heaters utilizing the jacket water from the engine as well as the exhaust gases for either hot water, steam or hot air heating in conjunction with the producer gas plant. The producers and the heaters are built in sizes of from 25 hp. up to 500 hp. in single units.

The Mineral Production of the United States in 1908.

The United States Geological Survey's summary of the mineral production of the United States in 1908, prepared by W. T. Thom, issued as an advance chapter of "Mineral Resources of the United States, Calendar Year 1908," shows a decline in the value of the country's mineral output amounting to about \$476,000,000, or 23 per cent. The figures for 1907 and 1908 are \$2,071,607,964 and \$1,595,670,186, respectively.

The loss is due to a decrease in the output of both metallic and non-metallic products. The most notable decreases among the metallic products were in the production of iron ores (30 per cent. in quantity and 38 per cent. in value) and of pig iron (38 per cent. in quantity and 52 per cent. in value). The production of bituminous coal decreased about 16 per cent.

Gains are shown in the production of gold and in the quantity of copper produced, but this gain in quantity was accompanied by a loss in total value, due to the lower prices of copper. Petroleum showed a gain of about 8 per cent. in quantity and value, 179,000,000 barrels having been produced in 1908 and 166,000,000 barrels in 1907.

Considerable gains in mineral production were made by several States. California gained 15 per cent., Florida 24 per cent., Louisiana 11 per cent., New Hampshire 16 per cent. and South Dakota 72 per cent. The losses, however, were out of proportion to the gains. Alabama lost nearly 33 per cent., Colorado 17 per cent., Illinois 15 per cent., Michigan 34 per cent., Montana 22 per cent., New Jersey 35 per cent., New York 33 per cent., Ohio 35 per cent., Pennsylvania 28 per cent., Virginia 32 per cent. and West Virginia 16 per cent.

The pamphlet, which may be had by applying to the director of the survey at Washington, contains tables showing the mineral production of the United States from 1880 to 1908, the production of each State and Territory in 1907 and 1908, and the imports and exports of mineral products in 1907 and 1908.

At the recent meeting of the Otis Steel Company, Ltd., in London, T. Frame Thomson, one of the three managing directors, said that the high mark of profits was reached in 1907 at £158,000, and that now all traces of the old misfortunes of the company had been removed from the balance sheet. The average yearly expenditure for improvements over 13 years had been £22,600, with an average annual increase in profit of £8000. With the new plate mill capable of rolling plates more than 12 ft. wide it was hoped a gradual increase in dividends could be made.

Census Metal Working Schedules.

Text of Special Schedules to Be Used for the Thirteenth Census.

WASHINGTON, D. C., December 3, 1909.—The Director of the Census, with the aid of the chief statistician for manufactures, has prepared tentatively the schedule covering metal-working machinery, which is to form a part of the thirteenth census, the schedules for which will be presented to manufacturers by special agents soon after January 1. This schedule, which is supplementary to the general schedule for manufactures, heretofore described in this correspondence, is made public through *The Iron Age* to bring it to the attention of manufacturers of metal-making machinery throughout the country, for the purpose of soliciting criticisms and suggestions with reference to its form and especially as to the classification adopted. Inasmuch as it will be necessary for the Census Bureau to print all the special schedules in their final form at an early date, suggestions to receive attention must reach the director not later than the 6th inst. They should be addressed to E. Dana Durand, Director of the Census, Washington, D. C.

In framing the schedule for metal-working machinery the experts of the Bureau have consulted a number of manufacturers and have endeavored to adopt a classification that will prove generally satisfactory. It is, of course, out of the question to enumerate every type of machine now produced, but the Bureau officials desire to include all important classes and especially to make the category sufficiently comprehensive to constitute an up-to-date classification embracing all new and important types.

Following the policy of the director to eliminate from the supplemental schedules questions of an inquisitorial character, the officials in the preparation of this schedule request manufacturers to give the number only of the various kinds of machines produced and not the cost thereof. The only figure relating to cost embraced in this schedule is the total value of all metal-working machinery manufactured during the year. As in the case of the general schedule, the data supplied will relate to the calendar year 1909, or the business year of each establishment most closely conforming thereto. The schedules are as follows:

Metal Working Machinery, 1909.

Name of establishment.....
Name of owner.....
Location of factory { State..... County.....
 Post office.....

Products: Give the number of each kind of machine or tool manufactured during the year, as indicated. Report on this schedule also the total value of metal-working machinery manufactured during the year.

The total value of all products, including by-products and custom work and repairing, should appear only on the General Schedule.

Kind.	Number.	Value.
Arbor presses.....		\$.....
Bolt making machines.....		\$.....
Boring or turning machines:		
Horizontal.....		\$.....
Vertical.....		\$.....
Broaching machines.....		\$.....
Centering machines.....		\$.....
Turret chucking machines:		
Horizontal.....		\$.....
Vertical.....		\$.....
Cutting-off machines:		
Sawing (hot or cold).....		\$.....
Shearing.....		\$.....
Shaft (by turning tool).....		\$.....
Drilling machines:		
Vertical (hand or power).....		\$.....
Radial.....		\$.....
Gang.....		\$.....
Sensitive.....		\$.....
Drop presses.....		\$.....
Hammers:		
Piston driven (air or steam).....		\$.....
Belt driven.....		\$.....
Gear cutting machines:		
Cutting by disk rotary cutter—		
Spur bevel.....		\$.....
Rack cutting.....		\$.....
By rotary hob generating cutter—		
Spur and worm wheel.....		\$.....
By reciprocating planing tool—		
Spur and bevel.....		\$.....
Grinding machines:		
Cutter and tool.....		\$.....
Disk.....		\$.....
Cylindrical.....		\$.....
Flat surface.....		\$.....

Kind.	Number.	Value.
Key-seating machines:		
Draw or push bar.....		\$.....
Rotary cutter.....		\$.....
Lathes or turning machines:		
Hand.....		\$.....
Engine.....		\$.....
Turret, automatic or semiautomatic.....		\$.....
Screw (hand).....		\$.....
Milling machines:		
Horizontal.....		\$.....
Vertical.....		\$.....
Thread.....		\$.....
Nut making machines.....		\$.....
Pipe cutting and threading machines.....		\$.....
Planing machines:		
Traveling table.....		\$.....
Shapers.....		\$.....
Metal working machines:		
Drawing or shaping.....		\$.....
Power presses.....		\$.....
Punching or shearing.....		\$.....
Slotting machines.....		\$.....
Tapping machines:		
Horizontal.....		\$.....
Vertical.....		\$.....
All other metal working machines.....		\$.....

Total value of all metal working machinery manufactured during the year..... \$.....

The census officials have also completed the schedules covering automobiles and bicycles and motorcycles. In classifying automobiles it has been deemed wise not only to group them by types, but also by rated horsepower, the duplication being regarded as necessary and fully justified by the increased value of the information that will be imparted by the figures which can thus be presented in the final report on the industry. The schedules referred to are as follows:

Automobiles, 1909.

Name of establishment.....
Name of owner.....
Location of factory { State..... County.....
 Post office.....

1. Products: Give the number and selling value or price at the works of automobiles, according to kind of power used and horsepower rating, as indicated, and account for all products manufactured during the year, including by-products. If the establishment manufactured automobiles of varieties other than those enumerated, the kind, number and value should be reported under "Other varieties."

The total value of products in this schedule must agree with the total in the General Schedule.

Kind.	Kind of power used.			Value.
	Gasoline.	Electric.	Steam.	
	Number.	Number.	Number.	
Pleasure and family vehicles:				
Open.....				\$.....
Buggies.....				\$.....
Runabouts.....				\$.....
Touring cars.....				\$.....
Closed.....				\$.....
Other varieties (specify).....				\$.....
Public conveyances:				
Cabs.....				\$.....
Omnibuses, sight-seeing				\$.....
wagons, &c.....				\$.....
Ambulances.....				\$.....
Patrol wagons.....				\$.....
Business vehicles:				
Delivery wagons.....				\$.....
Trucks.....				\$.....
Other varieties (specify).....				\$.....
All other products, including parts, &c.....				\$.....
Amount received for custom work and repairing.....				\$.....

Total..... \$.....

2. Number of machines by horsepower rating:

	10	20	30	50	90
	Less than 10 hp.	but less than 20 hp.	but less than 30 hp.	but less than 50 hp.	but less than 90 hp. or more
Pleasure and family vehicles:					
Open.....					
Buggies.....					
Runabouts.....					
Touring cars.....					
Closed.....					
Other varieties (specify).....					
Public conveyances:					
Cabs.....					
Omnibuses, sight-seeing					
wagons, &c.....					
Ambulances.....					
Patrol wagons.....					
Business vehicles:					
Delivery wagons.....					
Trucks.....					
Other varieties (specify).....					
Remarks:					

Bicycles and Motorcycles, 1909.

Name of establishment.....
Name of owner.....
Location of factory { State..... County.....
 Post office.....

1. Products: Give the selling value or price at the factory and account for all products manufactured during the year, including by-products. Separately report the quantity and value of the products, as indicated.

The total value of products in this schedule must agree with the total in the General Schedule.

Kind.	Number.	Value.
Bicycles:		
Individual—		
Chain	\$.....
Chainless	\$.....
Tandem	\$.....
Tricycles	\$.....
Motorcycles:		
Bicycle	\$.....
Tricycle	\$.....
Delivery van	\$.....
Passenger	\$.....
All other products (including parts, &c.)	\$.....
Amount received for custom work and repair-		
ing	\$.....
Total	\$.....
Remarks:		

W. L. C.

The Sirocco Centrifugal Blower Fundamental Patent Sustained.

In a suit by the Sirocco Engineering Company (one of the constituent companies of the present American Blower Company, Detroit, Mich.) against the B. F. Sturtevant Company for infringement of the Davidson reissued letters patent Nos. 12,796 and 12,797, being reissues of the underlying original patent dated November 27, 1900, covering the Sirocco type of centrifugal fan or blower, a decision has been rendered by Judge Hough in the United States Circuit Court for the Southern District of New York upon a demurrer by defendant alleging that the reissued patents were void. The court, after describing the multi-blade or "squirrel cage" fan of the original patent, says:

The patentee discovered (as he originally asserted) that "by providing a relatively large intake chamber practically unobstructed by the projection into it of blades or other parts, and by employing blades which extend as short a distance from the periphery of the fan inward as is consistent with strength of construction," vibrations and eddies were minimized and the "velocity and volume of fluid discharged for a given speed of revolution (were) greatly increased." This was the kernel of complainant's invention. In other words, the discovery consisted in providing a means of constructing and operating a centrally rotating narrow bladed fan or pump of cylindrical form, with a large unobstructed axial intake chamber. The patent covered a large variety of forms, all cylindrical, all with large intake chambers, all with narrow blades, all axially rotated, and differing from each other only in the shape and size of the fan blades, their relations to each other in peripheral or circumferential adjustment, and the relation of casing to fan or pump.

After stating how the original patent was divided into three reissued patents, the court says:

I do not think it would have been possible for any form of drum shaped axially rotating fan with narrow blades and a large unobstructed axial intake chamber to have been constructed which would not have been either an infringement or an anticipation, according to the time of its devising. The only effect of these two reissues is to separate that form of fan in which the blades are as nearly parallel to each other as cylindrical construction will admit from that in which concave blades are so arranged as to be nearer each other at their outer edges than they are at their inner.

Constructing the reissued patents, the court holds:

The reissues in question are not broadened—that is, everything claimed or described in either of the reissues in suit was fully described and (in my opinion) claimed in the original patent. But neither have the claims been narrowed—that is, the sum of the three reissues is exactly equal to the original patent.

I know of no decision in which the effect of several reissues, in the aggregate exactly equal to an originally well drawn patent, has been considered; and counsel have not been able to bring any such decision to my attention. For myself, I think this original patent good on its face, with well drawn specifications and appropriate claims. I am, however, quite unable to see what good or harm has been done to the patentee or the public by these reissues, and (so far as the court is now informed) the defendant is not harmed nor are there any known intervening rights.

The court accordingly overrules defendant's demurrer with leave to answer on payment of costs. While this decision is not a final adjudication of all questions arising in this infringement suit, yet it disposes of the defendant's attack raised by demurrer upon the validity of the reissued patents covering the Sirocco fan.

The Colonial Steel Company, Pittsburgh, has elected the following officers: J. B. Findley, president; W. H.

Nimick, vice-president; Charles M. Brown, secretary; T. H. Childs, treasurer. The Executive Committee is composed of J. B. Finley, W. H. Nimick, J. B. Marsh, C. A. Painter and Frank B. Nimick. The business of the company has expanded greatly in the last few months. The output of crucible steel has been increased and the open hearth department is running at full capacity.

Customs Decisions.

Steel Railroad Frogs.

The Board of United States General Appraisers has decided that steel railroad frogs cast in a solid piece are not to be regarded for the purposes of duty under the tariff as manufactures of metal. General Appraiser Fischer, who writes the decision for the Board, holds to the view of the importers that the frogs fall within the tariff provision for steel castings. As assessed, the frogs paid 45 per cent., but under the finding made by the Board the duty is at specific rates according to the value of the goods. The American Shipping Company, representing the actual importers, will receive a refund of the excess duties, and the entries are to be liquidated on the finding of the Board.

Letter Openers.

The Board has taken favorable action on protests filed by A. L. Silberstein regarding the duty to accrue on letter openers which are made entirely of metal or of metal in combination with mother-of-pearl. Duty was assessed on the merchandise at specific rates as "pen knives," with specific duties. The importer claimed duty on some of the knives at 45 per cent. as manufactures of metal, and on the other openers at the rate provided for manufactures of mother-of-pearl. The claims are sustained.

Ferroalloys.

In a decision by Judges Gray, Lanning and McPherson the United States Circuit Court of Appeals has handed down a judgment adverse to the government in a case involving the classification of ferrochrome, ferrovanadium and ferro tungsten under the Dingley tariff. The question before the court was whether the law required these alloys to be classified for customs duties with ferromanganese mentioned in paragraph 122, at \$4 per ton, or as metals unwrought, at the rate of 20 per cent. under the provisions of paragraph 183. When the issue was before the Circuit Court that tribunal disagreed with the Board of General Appraisers, which classified the merchandise as metals unwrought, and put them with ferromanganese under paragraph 122. Judge Lanning, who writes the decision for the Appellate Court, says:

The decision of the Circuit Court is in accord with that of the Circuit Court of Appeals in the case of the United States against the Roessler & Hasslacher Chemical Company. The present attempt of the Government to show that on the facts now presented a different classification should be made is not convincing. There is some evidence before us that these ferroalloys can be wrought into different shapes and forms by forging and hammering, but it is not shown that such changes are commercially profitable, or that the alloys are to any extent imported to be themselves wrought into useful articles. We agree with the court that the facts in the case do not warrant a departure from the classification made in the Roessler & Hasslacher case. The decree is therefore affirmed.

Rifle Barrels.

Perry, Ryer & Co., have been successful in their contention for lower duty on rough-bored rifle barrels. The collector returned the articles at 45 per cent. as manufactures of metal. The firm maintained that the barrels are parts of rifles and should pay the rates specified for such goods. This contention the Board upholds.

Fish Hooks.

The Board has partly sustained a protest filed by Hibbard, Spencer, Bartlett & Co., regarding fish hooks made of wire. Lower duty on fish hooks made from wire is denied the Schwabacher Hardware Company.

Electrical Progress in the British Iron Industry.

The presidential address of Dr. Gisbert Kapp before the Institution of Electrical Engineers, London, England, November 11, gives a résumé of conditions in the electrical industry in Great Britain, and particularly in the application of electricity to the manufacture of iron and steel. Some extracts from the address are given below:

Winding Engines and Rolling Mills.

I take these two subjects together because the conditions under which electric driving is applied in both cases are more or less similar. Not only is the average demand for power large, but the maxima are large as compared to the average; the demand is intermittent; the pauses are short; the motion has to be reversed very quickly, and the torque the motor has to exert is at times very large. To meet these requirements many special systems have been devised, but all of them make use of two broad principles, namely, the use of a flywheel as a store of energy, and some means whereby the direct current voltage supplied to the armature of the motor may be varied without sensibly diminishing the total power supplied to the armature. In some early applications of electricity to winding engines secondary batteries have been used for store of energy instead of a flywheel, but the cost of these, and the difficulties of keeping the contacts of the tapping-off switches in order, have prevented a general introduction of this system.

Dynamic storage in some such way as first applied by Ilgner to winding engines and voltage regulations on what may broadly be called the Ward-Leonard system have made it possible to satisfy the very severe conditions under which winding engines and rolling mills have to work. In some special cases winding engines are driven direct by three-phase motor, but the motor to which a reversing rolling mill is mechanically coupled is necessarily a direct current machine. The motor which supplies power to the variable voltage generator may be either a direct current or an alternating current motor. To make the flywheel effective there must be speed variation. Where the original source of power is continuous current, this is, of course, easily obtained without loss of energy. Where three-phase current is the source of power the usual method is to employ a slip ring motor and some automatic device for inserting and withdrawing resistance in the rotor circuit, but this means some loss of energy, and for this reason the speed range of the flywheel is generally made smaller than with a direct current plant. It is, however, possible also in the case of three-phase plant to avoid the loss of energy in regulating resistances by adopting some kind of cascade working. Such an arrangement has been worked out about a year ago by Brown, Boveri & Co. The variable rotor resistances are replaced by a direct current armature working in a three-phase stator, and the power developed mechanically by this armature may either be added mechanically to that of the three-phase motor, or electrically to the supply circuit. In the latter case an additional generator is, of course, required.

Electrically Driven Blooming and Bar Mills.

A good example of modern English practice in direct current rolling mill electrification is the plant supplied by the Electric Construction Company, Ltd., of Wolverhampton, to the steel works of Sir Alfred Hickman, Ltd., of Bilston. The makers have given the following particulars: The flywheel set consists of a 2000-hp. direct current motor, two 28-ton flywheels and two generators capable of giving any voltage between 1000 and +1000 volts. The excitation of the motor is adjusted automatically so as to produce a speed variation of the flywheels between 290 and 350 rev. per min. The energy given out when dropping from the higher to the lower speed is 46,000 hp. seconds. This set supplies power to a cogging and a bar mill. The cogging mill motor works a 30-in. mill, and when cogging down ingots of three tons weight has to develop 4800 hp., and for two-second periods once an hour 9600 hp. The bar mill motor works a 24-in. mill, and has to develop 6000 hp., and for two-

second periods once an hour 12,000 hp. The maximum speed is 120 rev. per min., and the time occupied in reversing from maximum speed in one direction to that in the other direction is six seconds.

In Germany the electrification of rolling mills has gone hand in hand with the development of the internal combustion engine, working with coke oven or blast furnace gas. A list prepared by Erhardt & Sehmer, in which particulars are given of those gas engine driven dynamos which supply current to iron and steel works, shows that a little over 50,000 hp. has been installed by this firm alone. The largest unit is 2300 hp., and the average is 1460 hp. Since similar plant is also supplied by other makers, the total horsepower used in Germany in electrified rolling mills and other heavy machinery in iron and steel works may be estimated at considerably over 50,000 hp.

Electric Steel Furnaces.

The reduction of iron ore by heat applied electrically has not yet advanced much beyond the experimental state. A plant for the electric production of iron direct from the ore has been erected in Domnarfvet, Sweden, but the production is only about six tons a day. The consumption of coke is restricted to the quantity required for the reduction of the ore, say, about one-third of a ton to the ton of pig produced, as against one ton in the case of an ordinary blast furnace. Thus the saving of two-thirds of a ton of coke represents the commercial advantage of electric reduction of ore, and against this must be set the cost of energy. This process could only be successful in a country where electrical energy is exceedingly cheap and fuel very dear.

When we come to the manufacture of steel from pig, or the refining of steel, the outlook is far more hopeful; in fact, the experimental stage has long been passed and the practical results obtained are eminently satisfactory, not only in a technical, but also in a commercial sense. Even where owing to the price of power the electric process is no cheaper than the thermic process, the former enables the steel refiner to achieve results with certainty and regularity which under the old methods are hardly attainable at all, or only, so to say, by good luck. In the furnace electricity is merely used to produce a large amount of heat locally; there is usually no electrolytic action. All furnaces are worked with alternating currents, the heat being produced either in an arc or by the passage of the current through the metal itself. It is just 30 years ago that the late Sir William Siemens patented an electrically heated crucible. The arc was formed between the metal in the crucible and a water cooled electrode projecting downward through the cover. This principle is still adhered to in the modern arc furnaces. A drawback inseparable from the employment of electric arcs is the great fluctuation in the load, making it impossible to work an arc furnace from a circuit which supplies other consumers. This difficulty is overcome with the so-called "induction furnace," where the heating is by ohmic resistance. The term "induction furnace" has been given to this type because the heating current is generated by induction in the metal bath itself. The electric furnace for steel making and steel refining is now an important accessory in steel works, and thousands of tons of steel are produced annually, both in furnaces of the arc and in those of the induction type.

The Electrical Industry in Great Britain.

When one reflects that nearly every industry in the country has been, or might be, furthered by the use of electricity in one form or another one comes to see that an enormous field of useful work is open to the electrical engineer and the interests that employ him. How, then, comes it that electrical engineering is not as prosperous as it might be? Some say because we are backward as compared with our foreign competitors. If by that term they mean that our electrical engineering works cannot produce equally good plant as our rivals, I cannot agree. I have frequently visited Continental shops, and, although I am quite willing to admit that excellent work is done there, I am also convinced that British shops can turn out work equally well, and generally at a slightly lower prime cost. There is certainly no justification for re-

proaching the makers of electrical plant with backwardness; and, moreover, it is bad business policy.

If, however, the reproach is leveled against the potential users of such plant there is some justification, and also a reason. Our great staple industries are old-established, and have been fairly prosperous for generations; those on the Continent are of recent growth, and had to struggle into existence against English competition. To become successful they had to adopt every improvement which science put at their disposal. With them the application of electricity is almost a vital matter; with us only a desirable improvement. Is it then to be wondered at if a works manager or owner, who has grown up in the pre-electric days, and has been doing a prosperous business ever since, should be rather slow in embarking on new methods of working which, to his thinking, might entail the possibility of risk and the certainty of greater mental exertion? There are, of course, exceptions; and a good many of them, as witnessed by the great strides which electrical methods applied to our staple industries have already made; but, compared with what the development might be, we must admit that we have as yet only touched the fringe of this vast field. There is progress, but it is not fast enough, and to accelerate it we must educate the potential users of electrical plant. A beginning in this direction has already been made by the managers of electric light stations. They are educating the householder by local exhibitions and literature that he can understand.

On the Continent every large electrical engineering firm has a literary department whose business it is to educate possible customers. No sooner is a new winding plant started, or a cotton mill electrically equipped, than well written, well printed and beautifully illustrated leaflets are sent out into the world to tell possible clients of the work done by the firm. Here, such literary departments are the exception; and thus it comes about that we hear so much about the great advances made on the Continent and so little about equally good work done here.

Crucibles for Oil Furnaces.

That oil furnaces require a different crucible mixture from that used for melting with coal or coke is emphasized in this comment by the *Brass World*:

So much experimenting and so much thought have been given the subject that the crucibles now supplied to users of oil furnaces are the result of many years of progress on the part of the crucible manufacturer. Had it been possible in the early days of oil furnaces to obtain crucibles of the character of those now produced much of the dissatisfaction then expressed would never have been heard. As instances have recently come to our notice in which oil furnaces were censured because of the short life of crucibles in them, there seems no better time to call attention to the fact that crucibles made for coke or coal furnaces cannot be expected to give satisfactory results in oil furnaces. The conditions are quite different, and the crucible mixture must be adapted to it. One would hardly expect to obtain satisfactory results in a steel furnace with crucibles intended for melting brass. The time-honored steel pot mixture is used for this purpose.

Crucible makers invariably supply crucibles of the special mixture for oil furnaces when they know how they are to be used, but there are many instances, no doubt, in which this information is wanting and they are not supplied. When the right mixture for oil furnaces is used, there can usually be obtained a number of heats on the crucible that will closely approach that obtained in coal or coke furnaces.

The open hearth steel works, rolling mills and other property of the Passaic Steel Company, Paterson, N. J., were sold at receiver's sale November 26 to T. H. Gonderman, representing the bondholders. The price was \$400,000. For some months the Manganese Steel Rail Company has operated a part of the property in the manufacture of its manganese steel products under arrangement with the receivers.

A German Plan for Using Dry Air Blast.

In *Stahl und Eisen*, November 10, 1909, Prof. B. Osann, Clausthal, Germany, writing of the Gayley dry blast, makes an interesting suggestion in view of the expected starting of an installation at a German blast furnace plant. The substance of Professor Osann's article is given below. It indicates that German skepticism persists, in spite of the showings made at American and British blast furnaces:

In German iron circles the early claims made for the Gayley dry blast process have not been generally accepted as correct. Instead of making a saving of some 20 per cent. in fuel, together with an increase in production of 25 per cent., calculations give the figures possible as 4 per cent. and 15 per cent., respectively, and these figures only when the air contains a relatively high percentage of moisture. The later publications relating to the Gayley process do not seem to dispel these doubts, but as the near future will witness a German installation a fuller discussion may as well be left until the data from this plant are available. The reports published about the Pottstown, Pa., plant would indicate that the fuel of the burden was in itself quite generous, even without drying the air. Furthermore, the present tendency in blast furnace practice is not so much to get dry blast as it is to keep the moisture that may be present as nearly constant as possible.

In connection with the proposed German installation, a few points may not come amiss. If the drying of the air were to be resorted to only when excessive moisture is present, and not continuously, the financial outcome would be a much better one. With the possibility of drying the air at will, immediate aid can be given the furnace when it begins to work irregularly. A change made in the burden, or the raising of the blast temperature, which in itself is difficult when the gases become poor, is necessarily a matter of time. By sending in dried air, the change becomes a very rapid one. The temperature zones shift at once. The hearth becomes hotter by perhaps several hundred degrees F.; irregularities in running are obliterated, particularly when the coke burden is reduced, and the difficulties in operation can be kept from becoming chronic. One of the very necessary conditions in blast furnace practice is the keeping down of the fuel burden to a minimum consistent with safety in case of atmospheric changes. Remove the excessive moisture when it appears and the necessity for an extra amount of fuel is removed.

Now there are furnaces and furnaces. Some work excellently with a small fuel consumption, and others require much more coke proportionately. Even with the dry blast it is very necessary to watch the furnace closely for the sake of safety. Investigation as to these differences in coke consumption usually leads to the suspicion that the shape of the furnace profile becoming changed through scaffolds, &c., there becomes necessary a change in the fuel burden to keep the furnace running properly. Now the dry blast will effectually combat these adverse conditions, if combined with a reduction in the fuel and watched closely. The dry blast therefore becomes a sort of blast furnace medicine, the proper use of which should mean a material reduction in the fuel bill when compared with the conditions existing when a furnace works as irregularly as some of the published reports indicate.

The conclusion would seem to be, then, that it is not necessary to install a dry blast plant for the entire capacity of a group of blast furnaces, but only for the largest; or, if all are alike, for one only. Provision should be made to cut this system in or out at any time. Application need only be made when one or the other of the furnaces shows indications of trouble. This application should be made promptly, so that the difficulty may not become chronic. In this way the initial cost may be held down one-fifth or one-fourth of what it would be otherwise.

A final thought would be that if the dry blast installation includes a steam plant the opportunity is given of adding small exactly measured quantities of steam to the blast, and this may become useful as a blast furnace medicine in the opposite direction.

Selling Hardware to South America.

A Great Field for Cultivation by American Manufacturers — Interesting and Profitable Experience of the Representative of a New York House.

Charles Emory Smith, former United States Minister to Russia and afterward Postmaster-General in the McKinley-Roosevelt cabinets, stated in 1896, in a public address, that the Latin races in South America number about 50,000,000 in population and imported approximately \$500,000,000 worth of merchandise, of which the United States supplied a ridiculously small proportion. The importance of those markets in the interval has grown in keeping with the increase of population to nearly 70,000,000, but they are still taking the greater proportion of their supplies from European sources. Some interesting information concerning this territory as a whole from a commercial standpoint is afforded by the experiences of William H. Spencer, a salesman connected with the export department of Sargent & Co., New York, who recently completed a two years' trip through South America.

At Jamaica and Gulf Points.

Mr. Spencer left New York in March, 1907, touching first at Jamaica, immediately after the earthquake there, putting up at a hotel where he was assigned sleeping quarters obtained by curtaining off a third of the dining hall, the entire upper portion of the building having been demolished. The Jamaica market is not a large one and as a rule takes cheap goods.

He then crossed to Colon, in Panama, and found little business on the Gulf Coast, but quite some activity in Panama City on the Pacific side, largely due to a demand for better materials as the result of the association by natives with American employers on the Trans-Isthmian Canal.

Down the West Coast.

From Panama he passed down the coast to Lima, Peru, skipping Guayaquil, in Ecuador, owing to the prevalence of fever which was raging at the time. Lima, the capital of Peru, is about 7 miles inland from Callao, its port of entry, and has long been the commercial *entrepot* for the northern portion of the west coast of South America. In Lima he found little in the way of building construction, although he was able to supply some of the finest cast bronze goods for the new Jesuit college of Guadalupe, which covers two large city squares.

There is a fair market for American tools, padlocks, &c., in Peru, but in builders' hardware the bulk of the goods used is of very low grade and come from Germany, especially in wrought iron rim locks. It is highly probable, however, that, as in all Latin countries, the actual introduction of good articles and the observation of their superior working possibilities by the people as they gradually come in contact with them will create a prompt demand for American products.

From Lima he continued down the coast to Mollendo, Peru, and up to the plateau and city of Arequipa, which in itself is a small market but an interesting city historically and otherwise.

Trade in the Interior.

By way of Puno and across Lake Titicaca (which is said to be the largest lake in South America and one of the highest lakes in the world, the surface being 12,500 ft. above sea level) he traveled to La Paz, the capital of Bolivia. Good business was found in La Paz, and as the railroad was then unfinished between that city and Oruro (Bolivia) he made that journey by stage in company with three other Americans, leaving behind 12 trunks of samples to follow on freight carts.

Business in Oruro was also satisfactory, and he made another stage trip across the divide of 16,000 ft. elevation to Cochabamba, which brought him down to a level of 7000 ft. on the eastern slope of the Andes Mountains. Mr. Spencer was told he was the first American hardware traveler that had ever brought samples (which

followed him on carts) to that city. From Cochabamba he returned to Oruro and by railroad traveled down to Antofagasta, Chile, stopping at Challapata and Uyuni en route.

A Good Business in Bolivia.

This finished the Bolivian part of the journey and was made very fortunately when the price of metals was high and Bolivian mines were working to their full capacity. The result in business obtained was surprising and the cause of much satisfaction on his part. He humorously asserts that he believes enough hardware was sold on that trip to last that section of Bolivia several years, and possibly it was as a result that a period of business depression soon followed. After his return he saw a letter to a prominent New York exporting house doing business with the west coast asking if it would pay travelers to solicit in that territory, but the changed financial conditions due to the decreased prices for metals mined there made it very improbable for some time.

Retracing Steps.

He then doubled back on his route to cover points a trifle further north on the Chilean coast and later went on southward, touching at Iquique, Coquimbo and a few smaller towns until he reached Valparaiso. They were then just clearing away the debris of a disastrous earthquake. Business was fairly good in very cheap material, as the country was then and is now in serious condition owing to its financial policy, it being on an even worse than silver basis.

South from Valparaiso.

From Valparaiso he worked his way south, touching at Santiago, Talcahuano, Concepcion and Valdivia, taking steam from Corral to Punta Arenas or sandy Point in the Straits of Magellan. Generally Punta Arenas is a good market, it being a free port, but from the time he entered Chile and reached Punta Arenas the value of a Chilean peso, paper, had declined from 18 pence to 8 pence in exchange, with the result that no orders were received at Punta Arenas worth mentioning.

It became a matter of serious consideration as to how many of the orders from other parts of Chile would be held up, awaiting an improvement in exchange. Fortunately the improvement came somewhat later and the work of the journey was not lost, although it will be a long while before Chilean exchange reaches 18 pence.

Buenos Aires and the Argentine Republic.

From Punta Arenas Mr. Spencer went to Buenos Aires, finding conditions there in marked contrast to those on the west coast. This city now has an estimated population of about 1,200,000 and is the metropolis of the very wealthy wheat, corn and cattle country, the territory of which is very extensive. There is a great deal of wealth in the Argentine Republic, but unfortunately American goods have not constituted as great a proportion in hardware lines as is true of the west coast.

The steamer communication from Europe is excellent, there being, he says, three or four Italian, three German, two English, three French and one Dutch steamship lines. This makes it possible to take a fast steamer almost any day for Europe. Mr. Spencer says it requires careful, painstaking work to introduce American goods there and satisfy a critical people, as the Argentines are generally very progressive and accustomed to good goods.

The people of Buenos Aires have already erected and are continuing the practice of constructing very fine buildings, and the general plan of the city is beautiful. There is a system of broad avenues, cut through the heart of the city regardless of the value of the property it was necessary to buy to accomplish the work, much of which was done about 10 years ago.

Argentina a Large Market.

The object of American manufacturers shipping to the Argentine should be to bring forward their best grades of goods because of the willingness of merchants there to purchase the best obtainable. There are many points which American manufacturers should keep in mind in dealing with this market. An important one is

that they must not take the stand that American goods are the best because they are American.

While our goods are certainly able to hold their own for quality, there are many just criticisms of them in that they often need changing to meet local conditions, and where American manufacturers are not willing to make concessions to this demand they had best keep out of the market. The American seeker for business will probably find on investigation, however, that the market is so large that it will justify making changes.

The Argentine Republic has several quite large cities, in the main supplied by the wholesale houses of Buenos Aires, making it a much easier proposition in selling than is found in dealing with the trade on the west coast.

Montevideo and Sao Paulo.

From Buenos Aires Mr. Spencer went to Montevideo in Uruguay, a city closely following Buenos Aires in its advantages, although much smaller and having fewer important buildings. It is a delightful city to visit, but the houses purchase much more cautiously. The question of credit in Montevideo is one of which the citizen is very proud, and it is probably better than any South American city except Sao Paulo, Brazil, to which place he journeyed from Montevideo.

In many ways, although not the metropolis of Brazil, Sao Paulo is the most progressive city of the republic. There has just been constructed a magnificent opera house after the general style of Paris opera. The sole dependence of the city is coffee, which is shipped through Santos, 30 miles southeast of Sao Paulo on the Atlantic. There was a great overproduction of this commodity while he was there, which injured business greatly and afterward caused the State Government to prohibit the planting of coffee in an endeavor to corner the product in the market. At first it was disastrous to the Government, but it is believed it may eventually be beneficial.

At Rio de Janeiro.

The next stop was at Rio de Janeiro, where he found general commercial conditions somewhat below normal, but the Government was carrying on an extensive building programme of a high order along the beautiful avenida recently constructed through the heart of the city and along the shores of a bay which is conceded to be, with possibly the exception of that of Sydney, the most beautiful in the world. There are said to be nearly 400 islands in the harbor. The bay is surrounded by hills of which there are approximately 20, having heights up to 1500 ft.

A Second Trip.

By this time Mr. Spencer found it desirable to make a quick run back to New York for the purpose of renewing and refitting his lines of samples, sailing again from New York for the east coast soon after, in April, 1908. At this time he made a flying trip across the continent and the Andes to Chile, returning in July of this year, spending about 10 months in Brazil, Uruguay, Argentina and Chile. The east coast takes much finer grades of goods.

Brazilian Tariff an Obstacle.

The great markets for the United States lie in Brazil and the Argentine. The up to date tariff laws of Argentina make that market one which has simply to be cultivated to accomplish good results. Unfortunately the tariff of Brazil was obviously made for trade conditions as they existed 100 years ago. It places an embargo on all goods of fine quality.

The duty levied on bronze metal hardware, for example, being triple that levied on iron or steel goods. Not only that, but there is great discrimination in the duty levied on two articles of a similar material, where one of them has some slight improvement in the way of a spring, &c. The duty levied upon an improved article is almost prohibitive.

What is needed is more satisfactory communication with the east coast by means of speedy vessels and reasonable freight rates. Also the application of the preferred clause feature of our new tariff in our relations with these countries. It is hardly to be expected that the influence of the State Department could effect any

revision of the Brazilian tariff, but if such a result could be accomplished, no matter by what means, it would certainly be a great benefit not only to the United States but to the Brazilian people as well, and there is at present a great deal of agitation on the subject among Brazilian merchants themselves.

Industrial Education at Beverly, Mass.

The need for developing industrially educated machinists from apprentices, which has long been recognized by machine tool builders, has become apparent to manufacturers in other lines who have been experiencing difficulty in getting skilled mechanics. The efforts of the United Shoe Machinery Company in that direction were recently described to the Boston Boot and Shoe Club by George H. Vose, assistant superintendent of the company's factory at Beverly, Mass., who told in an interesting manner what the company is doing in the way of industrial education. He stated that the city has a technical school supported by the city and the State Board of Industrial Education. The company has foreseen its future need for machinists and in consequence it has organized two classes of 25 boys, each recruited from its machine tool department. One class works in the machine shop while the other studies in the technical school, the two classes alternating every week. Mr. Vose continued:

"At the technical school we pay more attention than in the factory to the whys of the business. In the factory, as long as the work is turned out perfectly, we do not care whether the employee knows the use of the piece he is making or, except as is necessary, the action of the machine, but at the school we teach these points, and, in fact, make the scholar a practical machinist and less of a semiautomatic machine operator. We pay these boys one-half of what the factory hands are paid for the same work, and they earn an average of \$3 a week, although a few of them earn \$5 weekly. But besides these small earnings they get a thorough knowledge of the use of machinists' tools, and, in fact, learn the entire machinist's trade.

"While this class is working in the factory the other class is in the high school building learning the theoretical side, such as drawing, machine design, algebra, mathematics, as well as other subjects. They get no pay while attending this school, and this class the next week go to the machine shop, while the other class are in the high school.

"The students get no pay while studying at the high school—that is to say, while they are nonproducers. The object of all this is to help the boys to become all-round first-class machinists who can earn good pay in our shop or anywhere else. The factory instruction is paid for by the company. The high school work is paid for by the city of Beverly, but the State reimburses the city for one-half of this expense. The boy who comes out of this trade school we consider better than the graduate of any other trade school in the State.

"We are not trying to educate the students to be superintendents or foremen. We are simply fitting the boys to earn a livelihood, and if the students have the right stuff in them they will 'get there.' The boys who are now taking this industrial course fully appreciate its advantages. Some of them are poor boys, perhaps driven out of school by necessity, and in two or three years they come out first-class machinists, capable of doing the finest of machine work, whether it be on shoe machinery or any other kind to which they may turn their hands."

C. W. Taintor, 8 Congress street, Boston, Mass., has prepared a chart printed from engravings on stone in 10 colors presenting a statistical picture of the earnings of the United States Steel Corporation, and the disposition made of them for each quarter up to October 1, 1909. Accompanying the chart and bound with it in cloth is a description of the various diagrams with an estimate of the standing of the Steel Corporation's securities. The price, postage paid, is \$3.

THE IRON AGE

Established in 1855.

New York, Thursday, December 2, 1909.

Entered at the New York Post Office, as Second Class Mail Matter.

DAVID WILLIAMS COMPANY,	-	-	-	-	-	PUBLISHER
14-16 PARK PLACE, NEW YORK						
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A. I. FINDLEY,	-	-	-	-	-	
H. R. COBLEIGH,	-	-	-	-	-	
						MECHANICAL EDITOR

After nearly 30 years' service, I have decided to retire from the editorial management of *The Iron Age*, which during the past five years has devolved in an increasing measure upon my associates, George W. Cope and Alvin I. Findley, until they have practically borne the entire burden. Both have been in complete and hearty sympathy with the methods and traditions of the paper. They possess the accurate knowledge of the industries it represents which grows out of lifelong training. They will maintain the independence, strengthen the reputation for accuracy and fairness, and further develop the journalistic enterprise of *The Iron Age*.

C. KIRCHHOFF.

Compensation for Industrial Accidents.

The National Civic Federation's discussion of the employer's liability for accidents, at its meeting in New York last week, added to the accumulating stock of information on this important question. That is as much as can be expected at this stage of the agitation, for it cannot be said that there is any definite evidence of a clarifying of views as the discussion proceeds. So many legal questions enter in that great as is the task of unifying sentiment among manufacturers that is only one of the problems to be handled. Employers have shown more disposition thus far to bring this matter out of the thoroughly unsatisfactory state in which it has been for years than have representatives of organized labor, even though all the proposals now seriously considered involve the certainty of a considerable direct outlay by employers. The labor leaders have been more occupied with efforts to secure legislation making strikes effective. When asked for their legislative programme on employers' liability they have generally asked that contributory negligence of the injured and the fellow-servant rule be eliminated, so that employers may no longer make them the basis of a defense in accident litigation. At last week's conference in New York one of the chief of the labor leaders contended that carelessness of the workman is itself a necessary consequence of modern industrial operations.

It is not to be expected that employers will fall readily in line with proposals that put all the burden of accident indemnity upon the business. The easy way of all the theorists who have risen up to solve corporation problems is to pass all new tax burdens on to the product, to be borne by the consumer. That is only a way of laying them on the producer. The consumer cannot save

from ruin a business suddenly loaded with the responsibility of an accident wiping out its entire capital. Those who approach the question with the view that all the common law practice of generations is to be summarily wiped out will not advance its solution in the slightest degree. Moreover, sentiment is no substitute for just and practical proposals to remedy existing evils.

The introduction of various benefit plans, involving in some cases large contributions from the employer, is one evidence of the serious purpose of employing interests to afford practical relief even where under present laws the victim of accident or his family would have no recourse. Whatever comes of the present movement in certain States—New York, Minnesota, Wisconsin and Illinois leading the way in appointing commissions on the subject—the voluntary participation of employing interests in benefit association work promises to be greater year by year. The spirit behind this work should do much to aid agreement on new legislation. While it is common to say that the United States is behind most European countries in compensation legislation, more should be known of the results of European experience before the same plans are offered as a finality here. It is the inconclusiveness of the testimony thus far brought from Europe that in part has caused American employers' organizations to refrain from declaring for any particular plan. An insurable liability, limited compensation and some participation by employees in the maintenance of the necessary insurance are features favored by many employers, as the matter is viewed to-day. Excellent work has been done by the comparatively few who have delved into the subject that all employers might be informed on it; but it is realized that European methods cannot be readily grafted upon our industrial system, and that time will be required to work out needed modifications.

Meantime, one of the greatest benefits of continued discussion will be its constant stimulus to accident prevention. That is by all odds the paramount matter, and ways and means of compensating for injury and death are secondary.

Commissioners' Demurrage Rules.

The National Association of Railroad Commissioners, at its annual meeting at Washington last month, adopted its proposed national code of demurrage rules which was reviewed in *The Iron Age* of October 28, with no material changes in the rules as prepared by the committee. It is acknowledged in the printed report of the proceedings that leading railroad officials had assisted the sub-committee of commissioners in preparing this code, but it does not appear that any shippers or industrial traffic managers were afforded the opportunity to offer advice along this line.

There is evidence in the code of a feeling of hostility on the part of the people who prepared it toward large industries and a feature of the rules which deserves very careful attention is the apparent effort to make conditions more difficult for such industries. For example, no allowance is made for switching time for industrial switching roads or to industries which do their own switching. It has always been the custom of American railroads to make a time allowance for this service in addition to the usual 48 hours for loading or unloading. Where one railroad performs this service for another the allowance of switching time is always made, varying from one to four days. Under the rules of the American Railway Association an "average" time is allowed for switching, without any frills, quali-

fications or riders in the rules, a fact that may be of interest to those who believe in average demurrage. It is common knowledge among shippers that a railroad always takes from a day to a week to make a switching delivery on its own terminals after the car has arrived at the terminal yard, and the uncertainty in the time that will elapse before this service is completed has often proved embarrassing to the consignee. In fact, the inefficient manner in which railroads perform this switching service and the uncertainty regarding the time they will take to do it have compelled large industries to establish their own switching service. Wherever the reasonableness of switching charges has been called in question, in proceedings before State railroad commissions or other tribunals, railroad witnesses have always been ready to prove that the cost of the service is greater than the charges they collect for it, and that they are therefore performing this service at a loss when the switching is done by the railroad.

The discussion which accompanied the adoption of these rules makes it clear that the omission of the time allowance for switching was not an accident, but was deliberately adopted as a restriction on large industries of the character mentioned. The matter was so carefully considered that a phrase was adopted to prevent such industries from holding cars on their own terminals and using them for "intermill" service. It is provided that the time will be computed until the cars are actually returned to the interchange track. It was explained in the discussion that this phrase was adopted to prevent such industries from reporting a car as "released" and then holding it for a time before returning it. This point is mentioned, not because the practice referred to is common, but to show the careful effort that is made in these rules to create restrictions for the industrial shipper.

Another feature of this code which needs careful attention is the question of demurrage on "constructive" deliveries. Car service officials have never been very successful in collecting demurrage from a shipper who is doing the best he can, but is not able to take care of the cars as fast as they come in. There have been rules in all the demurrage districts which provide that time shall be counted against the consignee from the day that a car is tendered to him by the railroad. For many good reasons, however, railroad officials have been reluctant to bring suits in court against shippers for alleged demurrage accruing under these conditions, and many of the car service managers have hoped for the day when "constructive" rules could be enforced to the letter.

The manner in which this code has originated will give it greater legal authority than any demurrage tariff has ever possessed. It has been compiled and authorized by the Interstate Commerce Commission and the State Railroad Commissions as an ideal code. In due time it will be filed with the Interstate Commerce Commission by the railroads in the form of legal tariffs, and in accordance with the views of that tribunal it will become a part of the supreme law of the land the same as though the code had been enacted by Congress. In the event of a railroad bringing suit against a shipper to collect "constructive" demurrage, a court will attach great legal importance to the fact that this code originated with the Interstate and State commissions, and is not, like other tariffs or regulations, the mere act of a corporation. In current practice under this code counsel for the railroads may advise that the rules embodied in it are actually "law," and that no discretion

will rest with the agent to disregard or relax their provisions, even though strict enforcement may prove an absurd hardship to the shipper; and the same doctrine of law may confront shippers attempting to secure any fair adjustment or settlement of demurrage accounts. It is very clear in the discussions of the committee that it intended to devise a code that will deprive the railroad and its agent of all discretion in the assessment of charges.

A New Demand for Special Machinery.

A direct result of the scarcity of labor is the demand for special automatic or semiautomatic machinery to replace the usual methods of manufacturing which require the employment of skilled workmen. Builders of various standard classes of machine tools are sharing the market with those who specialize on these types of equipment. In manufacturing, where many duplicate parts are produced, one special machine may fill the place of a number of machinists and even of toolmakers, and is consequently of exceptional value to its owner under conditions of labor as they exist to-day. Therefore manufacturers can afford to pay literally for the development of machinery designed to meet individual purposes. The trend of the times was never stronger toward the replacement of men by machinery. Concerns that have developed for the market special types of tools adaptable to the work of various lines of manufacturing are extraordinarily busy. As a result, even builders of standard machinery such as grinders are now called upon by customers to relieve their situation by the introduction of automatic features. The influence upon general machine design should ultimately be pronounced.

An Automobile Invasion of Eastern Labor Fields.

A representative of a great automobile business of the Middle West is in the East with authority and funds to purchase outright a machine shop, equipped if possible, and to assemble 200 toolmakers as its working force. It is a rush effort to meet an emergency. The home plant is struggling to keep up with its planned production, but is seriously handicapped by local conditions. Not nearly enough tenements exist to house present employees. Tents and shanties are occupied as homes by hundreds of men. Great extensions of the plant call for the employment of more than 2000 additional workmen, which will make the problem of congestion even more serious. In spite of wages which may well be termed fabulous skilled men will not remain where their environments are so uncongenial and their everyday life so uncomfortable. Toolmakers are receiving \$11 a day, and proportionate wage schedules prevail for all classes of employment. As high as \$18 a day is paid to certain special men. Yet it is difficult to persuade them to stay. Attracted by the inducement of a large income they seek the town in great numbers, but the majority remain only a few days, many of them less than 24 hours. The tales of Western boom towns do not overdraw the conditions existing in this community, due to the rapid growth of this one great industry. It has become necessary, therefore, to go to other districts for large portions of that work which requires the best class of labor, especially for the toolmaking. The tools must be obtained outside or production cannot expand as desired. Cost has ceased to be a factor.

Automobile manufacturers occupy a unique position

with the machine tool trade, as has been often stated. They have been the best of all customers during two years of business depression, and they still lead as buyers. At the same time they have made production more difficult and expensive everywhere. Great numbers of men have been drawn from all industries employing mechanics. The East, in particular, has been depleted of men, especially of those of the younger generation, because of the opportunity offered them for continuous and lucrative employment. Machine tool builders are naturally questioning how much further these extravagant ideas which the automobile boom has developed in some quarters are likely to affect the conduct of their business. The instance cited is an extreme one, to be sure, but similar if less acute conditions exist in other places where the manufacturing end of this business is established. If, now, the territory of machinery builders is to be invaded by outsiders who will draw the best workmen in large numbers by the inducement of abnormal wages, the skilled labor situation will become worse than it is, which is saying a good deal.

A City's Effort to Get Foreign Business.

The Board of Trade of Bridgeport, Conn., proposes to employ a man to act as its representative in the Philippines, to exploit the products of the city's industries and find markets for them. A committee is at work on the proposition and is proceeding in a thorough-going way to bring about the result. American cities and towns have always shown a spirit of enterprise in the attempt to foster their industries and to attract new ones. A publicity propaganda has been the favorite method employed. Generally the work has not been done skillfully; at any rate it has brought insufficient results. But occasionally there is an exception, such as the plan, originating in the South, of establishing a fund to loan in the planting of new enterprises and the development of established industries. The Bridgeport idea looks promising. Not only would a capable representative in the Far East assist his own city, but in so doing he would help along the cause of American industry as a whole.

Industrial Education in Indiana.

The first meeting of the Indiana branch of the National Society for the Promotion of Industrial Education was held at Indianapolis, November 26. H. C. Atkins, head of E. C. Atkins & Co., saw manufacturers, presided, and John L. Ketcham, president of the Brown-Ketcham Iron Works, was one of the speakers. About 125 manufacturers, labor leaders and educators were present. Mr. Ketcham pointed to the supremacy of Germany over America in industrial education, Bavaria having 293 schools, while Indiana, larger than Bavaria, had only one, the Winona Technical Institute of Indianapolis. He said the apprentice needed the manufacturer more than the manufacturer needed the apprentice. The manufacturer faced a loss in engaging an apprentice for four years. He showed how the greatest manufacturing concerns in America, naming particularly the General Electric Company and the great railroad companies, naming the New York Central, were providing industrial education in their own establishments, in the absence of public provision for it. The smaller manufacturers could not do this, he said; thus public neglect was fostering the larger concerns as against the smaller. Some of the Eastern manufacturers, recognizing the superiority of foreign industrial education, were importing their foremen.

Edgar A. Perkins, for many years president of the Indiana Federation of Labor, said that organized labor is

not opposed to industrial education, mainly for two reasons: First because it meant good citizenship and second because it was easier to retain the skilled and efficient worker in the unions than the unskilled. He agreed with the manufacturers that the old apprenticeship system failed to meet modern conditions. C. N. Kendall, superintendent of the Indianapolis Public Schools, said there was need of industrial training for boys and girls between the ages of 14 and 18 years, who do not care for high school and drop out after a year there. He favored the plan being tried in some cities whereby they get employment part of the day at factories or elsewhere for pay. He said manual training requires many more teachers than book training, as individual attention is required and teaching by wholesale cannot be done. State Senator Ezra Mattingly and Prof. Paul E. Covert of the Indianapolis Manual Training High School were other speakers. This first meeting was merely to collect and compare views and find a basis on which to work.

Labor Notes.

The Glasgow Iron Company, Pottstown, Pa., has posted a notice at its two mills of an advance in wages, giving puddlers \$4.50 a ton instead of \$4 a ton.

Facts, the monthly publication of the Employers' Association of Cleveland, Ohio, gives the following figures: Population of Cleveland, 500,000; working men, 163,000; working women, 62,000; organized workers in trades unions, 25,000; unorganized workers, 200,000.

John P. Frey, editor of the *International Molders' Journal*, Cincinnati, Ohio, has returned from a trip to Europe, made for the purpose of negotiating agreements between the International Molders' Union of North America and the iron molders' unions of England, Germany, Denmark, Norway, Sweden and Austria.

Wages of sheet and tin plate workers for November and December will be the same as in September and October, under the recent bi-monthly examination of sales of sheets and tin plates made by several of the larger independent mills.

Railroad Equipment Orders.—The largest contract of the week is for 10,000 cars placed by the Santa Fe with the American Car & Foundry Company. The Chicago Great Western is said to have ordered 2575 cars from the same builder. The Atlantic Coast Line has ordered 1200 30-ton box cars, and is in the market for 300 30-ton steel flat cars. The Pittsburgh, Shawmut & Northern has placed 250 box cars and 250 gondolas. The St. Paul is expected to buy 200 to 250 all steel passenger cars. The Clark Car Company, Pittsburgh, has a contract from the Lake Superior & Ishpening for 100 steel ore cars of 100,000 lb. capacity of the balanced door type. They will be built by the Ralston Steel Car Company, Columbus, Ohio. Recent locomotive orders include 15 for the Pittsburgh & Lake Erie, 4 for the Soo Line and 5 for the Pacific Railway & Navigation Company. The Grand Trunk is figuring on 20 locomotives and the Chicago & Alton is in the market for 10 of the Mikado type. The Maine Central, the Boston & Maine and the Cincinnati, Hamilton & Dayton are said to be figuring on locomotives.

The Award Commission of the Alaska-Yukon-Pacific Exposition, Seattle, Wash., announces that the gold medal, first grand prize for two-cycle gas engines, goes to the Ferro engine, built by the Ferro Machine & Foundry Company, Cleveland, Ohio. The Ferro was also awarded the silver medal, second prize for heavy duty engines. The gold medal was taken by the San Francisco Standard four-cycle engine. This is said to be the first time that a two-cycle engine ever received a prize for heavy duty. In competition with the Ferro were a large number of the best known four-cycle slow speed engines. The judges' decision on reversing mechanisms gave the gold medal to the Ferro reverse gear. The gold medal for marine exhibits was also awarded the Ferro Company.

PERSONAL.

S. B. Sheldon has resigned as general superintendent of the Saucon Works of the Bethlehem Steel Company and will shortly sail for Europe. He is succeeded by C. H. Reynolds, who has been superintendent of one of the plants at South Bethlehem.

John Fritz, Bethlehem, Pa., according to a London cablegram of November 27, has been made an honorary vice-president of the Iron and Steel Institute, and in that capacity represents the United States. The active vice-presidents of the institute are residents of Great Britain. Under a new by-law the council is empowered to select a limited number of honorary vice-presidents from other countries. Mr. Fritz is a Bessemer medallist and has been for some years an honorary member of the institute.

R. H. Rehm, who was formerly connected with the Franklin Iron Mfg. Company at its Franklin Furnace, Clinton, N. Y., has now become associated with Nash, Isham & Co., 82 to 92 Beaver street, New York, and will travel for them through the New England States.

Charles C. Wright has resigned his position with the Cleveland office of the Carnegie Steel Company, with which he has been identified for 10 years, and has become connected with the Cleveland Tool & Supply Company, in which he is now financially interested. He will devote his attention to that company's steel tubing department.

L. Soule, who has been connected with the Harris Air Lift Company of Indianapolis, Ind., has been appointed manager of the sales department of the Service Pump Company, Orrville, Ohio.

The Pocahontas Fuel Company, 30 Pine street, New York, announces the appointment of E. O. Parkinson as its Norfolk (Va.) agent. He is now agent of the Norfolk & Western Railway Company at Norfolk and will shortly take up his new duties.

Isaac Gray, for some years connected with the Homestead Steel Works of the Carnegie Steel Company, has been appointed superintendent of the open hearth steel plant of the American Rolling Mill Company at Middletown, Ohio.

OBITUARY.

SILAS C. VAN DEVENTER, for the last 30 years superintendent of the Wrought Iron Range Company, St. Louis, Mo., died November 26, aged 71 years. He had been prominent as a manufacturer in St. Louis for 40 years. He was born in Louisville, Ky., was educated in the public schools of Louisville and at Western Military Institute, near Franklin, Ky., and at the age of 18 engaged in the manufacture of boilers. He went to St. Louis at the outbreak of the civil war and became associated with Captain James B. Eads in the building of the Eads Bridge. Later he contracted with the United States Government for the building of six iron monitors, and later aided Hamilton Brothers in the construction of six iron steamships. After the war he went back to Louisville and established himself in the manufacture of steam boilers, but at the end of three years he returned to St. Louis and took charge of the caissons of Eads Bridge, remaining in charge until the completion of the bridge. In 1879 he became superintendent of the Wrought Iron Range Company. He leaves a widow, a son and a daughter.

HENRY JUDSON BOOTH died in New York City November 26, aged 80 years. He was formerly a resident of San Francisco, where he went from Ohio in 1851. He was one of the founders of the Union Iron Works in San Francisco and was conspicuously identified with the early development of the city. He leaves a widow and three daughters.

PHILIP LATOURETTE, for many years manager of the insurance department and of the purchasing department of the American Cotton Oil Company, 27 Beaver street, New York, died November 22.

Coating Iron and Steel with Copper or Brass by Dipping.

After experiments extending over a period of years, Walter S. Rockey and Hillary Eldredge, 462 Tenth avenue, New York, have developed a hot process for coating iron and steel with copper, brass and other metals, in the way that coating with tin and zinc has long been possible. Electrodeposition of copper and brass has long been practiced, but a heavy coating is not possible in the case of brass. With copper, while a sufficiently thick coating may be had, the time and expense involved are considerable factors and an electrolytic deposit does not always adhere satisfactorily. The difficulties encountered in attempting to use a hot process for coating with copper and brass have grown out of the temperatures reached in melting these metals. When the steel to be coated was withdrawn from the bath the coating rapidly oxidized, burning off entirely or in spots. This was particularly noticeable with brass owing to the ready oxidation of zinc. Thus, as soon as the coated steel was withdrawn from the bath there was rapid decomposition of the coating; the zinc was burned out, leaving a scaly coat of copper and zinc, with some brass.

The new process depends for its success upon the flux employed to prepare the surface of the articles to be coated, also upon the method of handling the coating metals. If a thin coat of copper or brass is required, the amount of flux is so regulated and the coating metal is raised to such a temperature as to give a filmy layer. If a thick heavy coat is desired, the temperature is lowered and the proportion of the flux and its quantity are changed to suit the case. The flux itself is of such a nature as to be either thinly fluid or thick and viscous. The composition of the flux is not given by the inventors as yet, but it is said to be inexpensive and to be readily compounded. The molten plating mixture is contained in a crucible having a partition from the top almost to the bottom. Heat is applied continuously to maintain an even temperature. Floating on the top of the molten plating mixture on one side of the division wall is a flux designed to clean the articles as they are immersed and before they reach the plating fluid. The partition allows the flux to be contained in the half of the crucible through which the articles enter the bath and prevents it flowing to the compartment through which the articles emerge from the plating mixture. It is stated by the inventors that the cleaning flux is sufficiently powerful to free the iron surface from any rust, even though it be badly oxidized. It is more economical, however, to clean old articles before immersing, as all rust or dirt removed from the pieces in dipping is at the expense of the flux. Therefore by continually passing in articles badly rusted the cleaning effect of the flux would become more rapidly impaired. The entire operation requires little time, the articles being passed through the flux and the bath without being held therein for more than a few seconds, and after removal from the plating mixture are cooled, being then ready for use. It is claimed that the coating will not readily be affected by expansion and contraction, as in the case of sheets used for roofing. Under the rapid bending and straightening of wire and sheets dipped in the bath no effect of cracking or of flaking or abrasion was produced on the coating.

A great variety of articles apparently can be coated by the new process. The requirements in automobile manufacture of articles that are not only strong but of good appearance suggest that the cost of solid brass may be saved and yet a durable coating be secured. Rolled or drawn iron and steel coats readily and, if black, without pickling. Cast iron, owing, it is believed, to graphite on the surface, is not so easily handled; but when pickled or scoured may be coated as readily as sheet metals or wire. Sand blasting prepares the surface of cast iron excellently for the bath.

The Patterson Tool & Supply Company, Dayton, Ohio, has established a branch office at 2052 College avenue, Indianapolis, Ind., under the management of A. G. Schonacker.

The Railroads and the Public.*

BY GEORGE A. POST.

On the first Monday in December the President of the United States will send a message to the Congress. In less than 10 days from now that document will be completed and such recommendations as the President proposes to make regarding matters upon which legislation is desired in the public interest will have been decided upon. As we are assembled here to-night his mind is occupied in preparation of his forthcoming official deliverance. Many subjects are engaging his attention, but the one which has, for those at this dinner, the most vital interest in his pronouncement upon railroad regulation.

President Taft's Position.

The people of our country, regardless of partisan affiliations, believe that our President is a broad minded, earnest and well equipped public servant, who views public questions with a calm, judicial eye. That our country should enjoy prosperity during his chief magistracy is naturally the hope dearest to his heart. No one man, even though he be President, can know everything. He must seek and receive light and leading from those in whom he has confidence, and from those who possess knowledge of affairs with which he cannot be familiar.

During the progress of his recent extended tour the President has delivered many addresses, and he has talked freely of his impressions as to the necessity for regulation during the coming winter. At Des Moines, Iowa, he set forth a series of propositions which he said had been made to him by his constitutional advisers, looking toward further regulatory enactments affecting railroads. Those suggestions received wide publicity and have been discussed by those who are most deeply concerned throughout the country. I will not here enumerate them nor discuss them. Whether or not enactment along the lines suggested would be wise or otherwise, it is not my province nor intention here to maintain. At this critical juncture it is my purpose as an official representative of the Railway Business Association, to declare what, in our opinion, should be the attitude of all concerned toward the President and all those who shall have a part in the decision as to what shall eventually find lodgment in the statutes.

Our association represents a vast aggregate of invested capital and an army of 1,500,000 workmen. Just emerging from a terrible strain upon our financial resources, with our workmen just resuming remunerative labor, after many months of unemployment, we hope with intensest eagerness that industrial peace may be assured. Our prayer is that power shall be wielded with wisdom. By organized effort we desire to exert a permanent influence upon underlying conditions.

We read in the press that the President is receiving deputations, who call upon him representing interests to be affected by the proposed railroad legislation. This is as it should be. But what they say to him, when they are in his presence, is the all important thing, and what are the impressions left upon his mind by their statements and attitude. Unless they are frank and helpful, their visits are not only futile but absolutely harmful.

What is the President's predicament? He is imbued with the idea that the public is not yet satisfied with the statutory safeguards erected for their protection from what they consider the actual or possible denial of their rights by the railroads. He believes that the laws heretofore enacted have fallen short of proving adequately remedial and that they should be perfected. He says he wants the people's rights maintained, and, concurrently, that no harm shall be done to any rightful railroad interest. What he wants to accomplish is all right, and it ought to be accomplished. But the way he wants to do it may be wrong. How is he, and how are the lawmakers, to find out? Somebody with knowledge and honesty has got to tell the facts and the truth.

Railroad executives possessed of power to consider, concede and construct should now seek conference. In such conferences they should maintain an attitude that

will carry conviction of an earnest desire to help rather than obstruct. Greatest care should be taken to avoid the suspicion of being, as the Irishman said, "For regulation but ag'in' its enforcement." Nothing so kindles the wrath of public officials as to find, in consultation, a silent non-acquiescence, without reasons and without suggestions for rendering a proposed enactment harmless. The authorities await proof of good faith. The railroads, with their knowledge of the difficulties of the present situation, possess eminent qualifications to advise the form which legislation should take, and they ought to be listened to if the spirit in which they approach the official powers is generous and fair-minded, showing a disposition to recognize fully the rights of the public as contradistinguished from their private desires.

Public Supervision Still Experimental.

The whose scheme of public supervision of railroads is still largely experimental. When we reflect that the system has its foundation upon the conviction entertained by the people that railroads deal unfairly with them, it is small wonder that the point of view of officials bearing the commission of the people should be primarily permeated with prejudice. Those who find themselves clothed with great power over railroads are, of course, at first, men with but scant knowledge of railroad operations. At once their ears are beset by clamor that they shall do something. Such officials need help. Their value will depend upon the knowledge which they acquire. Railroad representatives should be scrupulously straightforward with them. If, in their initial inexperience of practical operations, they are controlled by purely ethical considerations, and are resisted rather than aided by those skilled in operation, regulation at their hands is likely to be unwise, narrow and harsh. Of what prime necessity it is, therefore, that railroad officials in conference should convince the authorities of their cordial disposition to co-operate in their plans wherever they reasonably can. By the establishment of such a relation, public officials may be led to perceive clearly the difference between enactments properly within the scope of regulation and those which trench disastrously upon the domain of management. The more the railroad officials show a disposition to concede the less are apt to be the demands for restraints upon them. While there will always be some obstinate implacables, no matter what may be done to placate, the American people as a whole are magnificently good natured and easily pleased.

If I have spoken at considerable length and with frankness upon what is considered to be the duty of railroad officials in seeking a solution of the problem confronting them, it has not been done as if such a line of conduct were the discovery of the Railway Business Association. We assume no airs of superior knowledge. As a matter of fact, the views stated in my remarks are those already entertained by many prominent railroad executives, and they are putting them into execution. Of course all railroad men do not agree upon all things. Neither do expounders of the gospel, nor do diagnosticians, when examining a diseased human body. Honest and learned men disagree stoutly in their deductions from the same set of facts.

Criticisms of Railroads.

Now, briefly, I would speak of some things that the public should bear in mind, and to express the hope that they, too, may be dead sure of their position upon this intricate transportation problem. It is the easiest thing in the world to find fault. It is quite difficult to criticize wisely. Without hesitation we admit that there have been, and now are, good grounds for many complaints of unfair and discourteous treatment at the hands of railroads. Efforts for relief, through legislation, have been resisted doggedly. Many of the laws passed amid prophecies of dire disaster by those to be regulated have subsequently been found to be blessings in disguise to the railroad. Being compelled to fight, inch by inch, for most of the statutory relief already secured the public, with ire aroused, has smitten the railroads hip and thigh, and while they have had their fighting clothes on the people, after they had won their fight, have hit them a lick or

* Address before the Pittsburgh Traffic Club, November 22, 1909.

two just because they are railroads. That is human nature, but I verily believe that a new epoch is upon us. There is an enlarged vision on the part of railroad officials as to the proper relations between the people and the railroads. Many of our foremost railroad executives have their minds focussed upon the formulation of ways whereby public resentment may be avoided. At this time in railroad circles the propaganda that is spreading is: "The public be pleased."

Bearing in mind that there are still many things that ought to be done in the interest of the public by the railroads, I yet beg to remind the public that there never was a time when the luxuries of railroad travel were so great as now; there never was a time when traffic was moved with such celerity as now; there never was a time when the country was so dependent upon efficient railroad service as now; there never was a time when so many men of brilliant minds were in the employ of railroads, working night and day to better serve the public, than at this very moment. In your ears I make this suggestion: Knock softer and boost harder, and we may be happy yet.

Nothing of more importance awaits sane settlement at the hands of our people than the railroad question. If it can be settled right, its blessings will ramify throughout the length and breadth of our land, giving assurance of a continuity of prosperity that will make comfortable millions of people. If it remains a bone of contention, with growling combatants fighting for advantage, the industrial horror we have recently tasted will be but the precursor of new depths of despair into which we shall all be plunged. In the presence of such a crisis we must face our duty with a determination that we will each and all be sober minded and fair. Nothing but failure can come if in the discussion of this question the atmosphere is charged with innuendo, denunciation and harsh epithet.

Inflammatory Language to Be Avoided.

As I was leaving New York I read with deep regret an interview published in one of the great newspapers of that city, in which an Interstate Commerce commissioner, not named, was reported to have discussed a rumor that the railroads would oppose the President's regulatory programme. As quoted, this official said: "Of course they will fight. The railroads are the biggest fools we have in politics." Now, I do not know that the commissioner was correctly reported. I hope not. It seems incredible that a judicial officer of our Government should use such language at such a time as this. I refer to this alleged interview, however, only to point the moral that by such utterances as these, whether from public officials, railroad officials or private individuals, the chasm of unfriendliness will only be widened. Oh, the pity of it! That we should approach the discussion of so grave a subject with fuming that blanches the cheeks, clenches the fists and makes men hate! Men and brethren, let us change the tune! Let us remember that

Boys, flying kites, haul in their white winged birds,
But you can't do that way when you're flying words.

The thought comes to me that it was here in Pittsburgh many years ago that a great movement was started by Francis Murphy which swept over our country and did a wonderful work in the cause of temperance in the use of strong drink. How appropriate would be Pittsburgh as the birthplace of another great temperance movement—temperance in the use of language. Talk about the homes made happy by abstinence from intoxicating drink! Why, it isn't a circumstance to the blessings that follow kindly words and acts. More hearts have been broken and greater property losses incurred as the result of ugly words than through inebriety.

Gentlemen, with all the earnestness of which I am capable; with keenest appreciation of the perils of passion; with a heart consecrated to this great work of pacification of conflicting interests; with a brain aglow with imagination of the wonderful possibilities for our national happiness that would flow from a spread of the gospel of conservatism, I propose to you, as my closing thought and appeal, that here and now we launch a movement against intemperance in speech. Let those who are here, and the people everywhere, sign this pledge:

"I do solemnly promise that in the future I will abstain from the use of all intoxicating and inflammatory language."

Sign this pledge and stick to it, and the economic troubles that confront us to-day "will fold their tents like the Arabs and as silently steal away."

Impure Tin and Defective Solder.

A communication to the *American Metal Market* calls attention to complaints arising from the fact that merchants selling the regular quality of Straits of Malacca pig tin have found themselves in competition with others who quote prices on pig tin and then ship some of the many brands now on the market containing but 98 to 99 per cent. of pure tin, while the Straits of Malacca tin is presumed to be at least 99.75 per cent. pure. The correspondent of the *American Metal Market* continues as follows:

The same condition applies to the manufacture of mixed metals, particularly solder. We have it on positive authority that a large quantity of this 98 to 99 per cent. tin is now being sold to manufacturers of solder. These manufacturers buy it at a fixed price below the market price of Straits of Malacca, but whether the customer gets 50 lb. of tin to every 50 lb. of lead is a question that is open to discussion in the interests of the consumer, who is invariably the sufferer, and we make the positive assertion that there are large quantities of solder manufactured to-day by our competitors, who do not furnish 50 lb. of tin to 50 lb. of lead when the consumer purchases and expects to receive that quality. If the solder manufacturer did not reap a material benefit in buying this impure or off-grade tin, as you might term it, why would he purchase it? For the little difference that exists in price between the genuine Straits and the 99 per cent., we claim that it is not enough of a saving in the manufacture of solder to use the lower grade of tin. Furthermore, you are well aware of the fact that when a customer writes to-day for the price of "half and half" solder, it does not mean anything so far as the quality is concerned. The consumer is the one who suffers, as he is just as likely to get 45 to 55 as he is to get 50 to 50, which he orders and expects to get. These are the deplorable conditions existing in the market to-day, and which you and other leading newspapers in the country should make an effort to remove.

Stove Manufacturers Discuss Molders' Wages.—At

a recent meeting in New York of the Conference Committee of the Stove Founders' National Defense Association a discussion of the molding machine and molders' wages questions received chief attention. This evidently was preliminary to the annual conference with the molders, which is to be held about December 15, when it is expected that the new agreement with the molders will be made in the light of the developments of the year and the desire to profit more fully from the use of the molding machine for increasing and cheapening the output. The committee will doubtless be confronted with a knotty problem, according to reports from the molders. Notwithstanding the experience of the past two years, when they found difficulty in securing steady work, the molders now point out that there is evidence of greatly improved business conditions and they will ask for an advance in wages. There is a rather strong feeling among general foundrymen, which is shared by a good many stove founders, that the stove molder is already better paid than molders in other fields, and that an advance in his wages should be strenuously opposed. The work of the Stove Founders' Conference Committee has at times been subjected to criticism, and the present situation does not seem to indicate less difficult problems for solution.

The International Machine & Screw Company, Springfield, Mass.—At a recent meeting of the Board of Directors of the International Machine & Screw Company, Springfield, Mass., Gorham C. Parker of Hartford was elected second vice-president. The company, which has been an experimental one for the past six years, has perfected its machine and is to commence manufacturing. This machine rolls threads on screws without any loss of stock at the rate of 72 per minute. George T. Warwick, vice-president and general manager, is the inventor.

Hardware Manufacturers on Trade Conditions.

Manufacturers of hardware almost uniformly report an excellent condition of trade. Some of them are experiencing difficulty in securing supplies of raw materials in sufficient quantity and with satisfactory rapidity of delivery to enable them to meet the requirements of their own trade. This does not seem to be a general experience, but it is, of course, exceedingly annoying to the individual who is thus suffering, especially when he feels convinced that the maker of his raw material, with whom he has contracts, is making shipments elsewhere at higher prices. The letters given below represent a wide range of the hardware trade, covering practically all the standard lines:

New England.

A leading maker of a staple article says: "I find the higher prices ruling on raw material as having a decided strengthening influence upon values and at the same time giving a confidence that is shown in the much freer purchasing on the part of the larger interests. At the same time, I believe the more influential manufacturers will hesitate about going very far toward increasing their prices for fear of checking demand. In the matter of raw material, I think those manufacturers who usually look ahead are well protected in their requirements and are not likely to be seriously hampered by delayed deliveries. In reference to the outlook for business, it seems to me that it could hardly be more encouraging, and the general indications seem to point to 1910 as being a year of very great demand, unless there should be some unforeseen disturbances in the political world. Some little uncertainty seems to prevail as to some of the policies of the new administration and as to whether or not some apparently conflicting views can be harmonized. Any conflict of this kind might possibly have some restraining influences on trade; also the situation in cotton is causing much uneasiness in the New England textile industries, and should the results be a final material curtailment of output it may affect unfavorably the consumption in other lines. But in general the outlook at the present time seems to be of the most encouraging nature."

A maker of important specialties says: "Unexplainable advances in raw material always create more or less disturbance. What we mean by 'unexplainable' is where the advance results from no apparently legitimate cause but seems to be the result of combination. There is an element of uncertainty about it that makes one wonder what the controlling hand is going to do in the future. The burden seems to come on the manufacturer, as it is as a rule impossible to recover from his customer the difference in cost by reason of the advance, for the question comes up, 'Will the increased cost continue?' As far as delay in shipments is concerned, on cold rolled steel we do not get as prompt shipments as we did formerly, and there is a feeling, as far as we can see, of a little more independence on the part of the mills. As to the outlook of business for the next few months, we must say it looks very encouraging. We are rather a conservative concern—perhaps too much so—but the trade that we get is on good lines and not the result of any special extra effort. The month of October was one of the best months we have ever had, and we are glad to say our trade is running along pretty steadily and uniformly. The new tariff is young yet and we have not got into its workings, so that we cannot tell how that is going to affect us, but we do not anticipate any trouble."

Another maker of specialties says: "We find that there is a tendency toward higher prices in steel products; at the same time we are looking for higher copper. We consider the present outlook for business for next year as very good."

A manufacturer of tools says: "The tendency in the material market is toward higher prices; we have already been notified of many advances, with intimations that more are to follow. We also find it very difficult to procure deliveries with anywhere near reasonable promptness. It has looked to us for some months as though there would be a marked shortage in many lines after

the first of the year. The wise merchant will keep his stock in good shape and anticipate his requirements all that he feels he can. It is difficult to make a more detailed analysis of anticipated conditions. We sincerely hope that the speculative tendency so manifest during 1906-7 will be avoided during the coming year; we are frank to admit, however, that strenuous times are ahead of us and it behooves every manufacturer to make his arrangements accordingly. We believe the manufacturer who can fill orders promptly during the spring of 1910 will be the exception rather than the rule."

A maker of cutlery says: "The higher prices ruling for raw material must sooner or later cause an advance in the price of manufactured goods or a cheapening in the quality. We are experiencing some difficulty in securing prompt shipments, but not so much as we had in the rush of 1906 and 1907. I am naturally an optimist and perhaps on that account I cannot judge of the future as well as some others who are more level headed than myself. I cannot see, however, why we should not have an excellent business for the next 12 months. It certainly is good now, so far as we can see, and we believe it must continue for a considerable time to come."

Another manufacturer says: "It seems that higher prices are generally prevailing on goods, particularly in raw material and supplies, although we have not ourselves made a change in our prices. We experience some difficulty in getting prompt shipments. It seems to us that business during the next few months is going to increase to a considerable extent and that it behooves all manufacturers to look carefully to their source of supplies and raw material, so as to be sure and not let themselves run short. We think that the majority of manufacturers for another year will be having all that they can possibly attend to."

A manufacturer of machinists' supplies says: "We do not see that the higher prices which are now ruling for raw material affect in any way the volume of business which we expect and are receiving. We are certainly experiencing difficulty in securing prompt shipments of material and anticipate that there will be no improvement in this direction for some time, owing to the difficulties attendant upon winter transportation. We consider the outlook for business for the next few months to be particularly fine and expect no difficulty in securing all the business that we can handle."

Another manufacturer of supplies says: "The higher prices ruling for raw material have caused a slight advance in our manufactured product, but up to the present time we have not experienced any difficulty in securing prompt shipment of such raw material as we require. We have, however, anticipated our wants sufficiently far ahead to take care of anything but a serious delay on the part of the manufacturers. The business outlook for the next few months seems to indicate a considerable improvement over what it has been for the last six months."

Another maker of supplies says: "Our plant is crowded to its fullest capacity. We regret to say that the ability to secure raw material is very discouraging. It seems impossible to obtain promises in less time than two to three months under the most favorable conditions."

A tool manufacturer says: "Business conditions seem to be improving continually and we look to see it rather difficult to keep ourselves supplied with raw material."

Middle States.

A manufacturer of edge tools says: "The past two months lead us to believe that we are now at the threshold of a great business era, similar to the memorable years prior to 1908. Perhaps the most substantial evidence we have that present business will still improve is the condition of the steel mill contracts. It is next to impossible to get even fairly prompt delivery of raw material at this time. Our October shipments show a considerable improvement over September, also the corresponding month last year. November business to date

shows still better than October; in fact, we have started our works to the full capacity, nearly all orders being for rush shipments, and there is a noticeable increase in size as compared to last year. The number of telegraphic orders received also demonstrate to us that the trade is almost entirely out of stock, and immediate shipments are almost out of the question with us at present."

Another tool manufacturer says: "On raw material our purchases are confined to the requirements of material used in the manufacture of steel. We are experiencing some difficulty in getting material from Sweden on account of strikes and other complications which exist in that section at the present time. We do not find any great difficulty in obtaining such other material as is necessary for us to buy from time to time to operate our plants, such as oils, supplies, &c. These would be the only other things that would be affected, as the steel used in our factory is made in our own works. The outlook for business during the next few months is very bright; orders coming in show a very healthy condition. In fact, at the present time they are better than they have been since the slump in the market which occurred in November, 1907. We anticipate very good business for the balance of the year, and after stock taking and the adjustment of accounts January 1 we feel that business will assume even greater proportions and exceed the volume of business which we had in the early part of 1907."

A maker of kitchen supplies says: "We find higher prices ruling on raw materials, but we have not as yet experienced delays in shipment sufficient to cause us embarrassment. Generally speaking, I would state that shipment of our raw materials is made with reasonable promptness. As to the outlook for business during the next few months, we feel very confident that the volume will be entirely satisfactory. Our experience has been that since the tariff bill became a law buying has been reasonably free and the total volume can be favorably compared with good periods in the past. We do find, however, that new orders during the past two or three weeks have been spasmodic and that the total volume is hardly as large as formerly. In other words, there seems to be a hesitancy in the onward march toward better things, which perhaps in the end will be healthful."

A manufacturer of specialties says: "With us the volume of business received during the past two months is unprecedented and it continues true up to the present time. We have experienced little difficulty in obtaining raw material, but have had difficulty in prompt shipments of finished supplies, such as screws, wire, &c."

A very large manufacturer in staple lines says: "The higher prices ruling for raw material have made no diminution in the number or amount of orders received. We are extremely busy, with the prospect that we will continue so at least during the first three or four months of next year. We have great difficulty in securing prompt shipments on any class of manufactured material."

Western States.

A manufacturer of specialties says: "The higher prices ruling for raw materials work a hardship on the manufacturers, as a rule, as most of them book contracts in the early fall with their jobbing customers to supply them finished goods at a certain price for the entire season, which ends about July 1, and as those prices are generally based on the prices of materials in the early summer and contracts for materials cannot be made to extend beyond January 1, the manufacturers are compelled to pay these advances but can get no advance on their finished products. Advancing prices generally stimulate business for a short time, because every one rushes in to buy before the advance, but they retard purchases afterward. We find difficulty in securing prompt shipments of materials, as most steel mills want anywhere from six weeks to three months to fill orders, and it is impossible to estimate requirements intelligently that far ahead. We doubt whether the business during the next few months will be any greater than it was a year ago, and a continuation of advances in the prices of raw materials will have a tendency to retard it."

A large manufacturer of specialties says: "The buying power of the consumer justifies a correspondingly increased business from the dealer, whose buying attitude

at this time is really in harmony with the atmosphere that prevails, influencing considerable additional business, and the opinion that we will be busy for several years to come. If, however, raw materials are to advance much more, a pronounced advance would be necessary on the finished product, which in our judgment would be unfortunate, because of its creating a shy and cautious buying attitude, different from present conditions, reverting in time against the manufacturer. The buying power of the consumer being established, to avoid advance in price of the finished product, we feel like recommending the shortening of terms and the selling of our product to the dealer for cash or substantially so, and he in turn to the consumer for cash or substantially so, so that we do not have to disturb the base, and avoid the wide difference in price that has and does prevail in many cases between the distributor to the purchaser direct and that of the dealer to the purchaser, who unfortunately does not sell and buy right, so that that advance could be made, and thereby hold his trade along the lines that we feel should be considered, and that would in the end revert advantageously to the dealer and manufacturer, the buying power at present justifying the shortening of terms and a corresponding price to the consumer."

An important maker of tools says: "We have noticed some disposition on the part of the mills, under present conditions, to give preference to current orders at higher prices, and, as far as possible, hold up shipments on contracts given at lower prices. Of course, this is always the case, so that it is nothing at all unusual or unexpected, and we have not, so far, experienced as much difficulty on account of delays as we have had other times in the past when similar conditions prevailed. The outlook for business during the next few months seems very encouraging. There has been a steady increase in the volume and size of orders received since July 1, and we believe that this will continue right along, with the possible exception of the holiday season. After January 1 we look for the best business we have had since the panic."

A maker of specialties says: "We have considerable competition on some of our goods which makes it very close selling for us to make any profit. We are experiencing some difficulty in getting both malleable castings and steel plates, as the manufacturers are at least 60 days behind in their deliveries to us. We expect an excellent year's business for 1910, and the fall business is also first class."

A maker of a wide line of hardware says: "We find there has been quite a strong advance in the prices of goods that we are using, among the principal articles being pig iron. This is also the case with coke and steel, but we are pretty well covered by contract for our requirements in these lines for the next six months and are having no difficulty in getting a stock forward as fast as we require it. The outlook for future business is very good."

A maker of specialties says: "There has been no great advance in the material that goes into our products. The outlook for business is excellent. We have more orders on our books to-day than we have ever had before, and we think the next year will be a 'hummer.'"

A patent was granted October 12, 1909, to Charles J. Kirk of the United States Sherardizing Company, New Castle, Pa., on an improvement in tinning and galvanizing. It covers "sherardizing" the iron or steel articles in the usual manner by tumbling them with zinc dust, and then dipping them in molten tin or zinc to tin or galvanize them. The inventor claims that the coating of zinc produced by the "sherardizing" process is so thorough that it binds the succeeding coating more completely than would the simple dipping of the iron or steel without the previous treatment.

The country's gold exports thus far in 1909 have broken all records. Their total is now nearly \$115,000,000; the highest previous yearly record was \$104,969,000 in 1895.

History of the Cincinnati Machine Tool Business.

The November issue of the *Cincinnati Magazine*, a monthly devoted to the industrial and commercial interests of Cincinnati, Ohio, deals largely with the machine tool and machinery manufacturing industries of that city. There are also well written sketches covering the proposed new subway, the new union depot, smoke abatement, the skyscrapers, cost of living, the Triumph Electric Company's new plant in Oakley, and a brief history of the machine tool industry in Cincinnati by President William Lodge of the Lodge & Shipley Machine Tool Company, one of the pioneers. Mr. Lodge's article is as follows:

In the year 1872, when the writer located permanently in Cincinnati, the only concern engaged in the making of machine tools of any note was the firm of Steptoe & McFarlan. They made lathes, planers, shapers, drill presses and some milling machines, and employed on this work about 20 men in good times, but from September, 1873, until December, 1879, they did not employ an average of over five men on this work.

January 1, 1880, the firm of Lodge & Barker was formed and commenced the manufacture of lathes, and extended the business so that the growth up to 1890 enabled them to employ some 400 people. Part of this work was made by former employees who had been assisted to go into business by the firm, which had changed its name from Lodge & Barker to Lodge & Davis.

In the same year of 1880 commenced the firm of the G. A. Gray Company and the Cincinnati Screw & Tap Company, which afterward developed into the Cincinnati Milling Machine Company. All three companies grew rapidly and by the year 1890 had increased their capacity to such an extent as to have a reputation not only all over the United States but also in Europe.

Between 1880 and 1900 many other concerns engaged in the manufacture of machine tools, most of which branched directly or indirectly from the original Lodge & Barker—Lodge & Davis concern. For instance, the Lodge & Davis Company contracted for and marketed all the product of the Fosdick Machine Tool Company, the William Barker Company, and later gave large orders to Dietz & Schumacher, later Schumacher & Boye, also gave contracts to R. K. LeBlond, and was the cause largely of the companies named engaging in the machine tool business. Dreses of the Dreses Machine Tool Company, the members of the Cincinnati Planer Company and Greaves & Klusman Company were all former employees of Lodge & Davis. The company also bought the entire output of Smith & Silk, afterward the Kenton Machine Tool Company, also that of the Springfield Machine Tool Company and of the Kempsmith Milling Machine Company. Fourteen concerns making machine tools have branched directly or indirectly from the Lodge & Davis Company.

Since 1890 several other manufacturers have engaged in this line of business—namely, the Bradford Machine Tool Company, Rahn-Mayer-Carpenter Company, Smith & Mills and many others.

The city now has a world wide reputation and is rapidly beginning to be looked upon as the machine tool center of the world. The main reason for any city becoming the center of any particular industry, aside from its location, having advantages in supplies and shipping, is the fact of one concern, whose members were well known as either workmen or foremen, starting with a very small capital, building up a successful business, and the workmen in the same line seeing the success and getting the ambition to follow suit. It has been objected that the engagement of these young men is merely building up competition for the house that attempts building an industry in this way. It has been our experience, however, that competition in any given line makes a larger market for the city and consequently brings more buyers, and by reason of this lessens the feature of competition in a hurtful manner, and, in fact, rather increases the market so much more that there is more for each and every one engaged in the business than if only one concern in that line were employed in one city, and

herein lies great possibilities for our city. If any new industry is commenced by young and ambitious men, no matter how small the capital, and is successful, and the market for that industry is not purely local, but national and international, there is hardly any limit to what its growth may be.

It is lamentable that we have not had a thoroughly successful automobile factory here. We would probably have built up that industry into the millions, as it has been built up in the past few years in Michigan, and care should be taken by the Industrial Bureau to encourage such industries as are described above, so far as the market is concerned, rather than those having a purely local market.

The Aluminum Company of America.

The Aluminum Company of America, whose headquarters are in Pittsburgh, has declared a stock dividend of 500 per cent. It recently gave notice that it would increase its capital from \$3,200,000 to \$25,000,000. The company is now paying the equivalent of 24 per cent. per annum on its common stock. No recent quotations have been made on the stock; it sold some months ago as high as \$350 per share and in 1907 at \$500 per share. Although the company has made no recent exhibit of its financial condition, it is understood that this stock dividend does not extend beyond the capitalization of the present surplus. The declaration of a stock dividend has been expected for the last three years, but was delayed by the 1907 panic and is part of the general plans of the company to enlarge the scope of its operations. The stock dividend entails the issuance of \$16,000,000 additional stock, bringing the outstanding common up to \$19,200,000. In 1904 the company had but \$1,000,000 common outstanding, but declared a 100 per cent. stock dividend in that year. From the *Boston News Bureau* the following statements are taken:

The company is preparing for very extensive property enlargement, with the idea of increasing its output and being in line to meet the demand incident to new development schemes in this country and Canada. For this purpose the company, through one of its subsidiaries, has applied to the Canadian Government for the privilege of damming the St. Lawrence River near Brockville, N. Y., so as to create a water power of some 80,000 hp. This power will be used in additional plants at Massena, near the present properties in which the company has a \$5,000,000 investment.

In spite of the expiration in February last of the patents under which aluminum has been made in this country, the Aluminum Company of America has not as yet met with any competition on this side of the Atlantic. European competition does exist, however, but against this the company is protected by a fairly high tariff.

The present capacity of the Aluminum Company is understood to be about 20,000,000 lb. per annum, which is nearly 40 per cent. of the world's total production of aluminum. Last year, however, the company did not output more than 8,000,000 lb., and at the present time is not operating at much better than 50 per cent. of capacity. The price of aluminum ingots has been held firmly at 24 cents per pound for many months, which is a reduction of over 35 per cent. from the 1907 high. Through further reductions in price the company expects to popularize the use of aluminum and greatly increase its output.

The Continental Gin Company, Prattville, Ala., has obtained from the Treasury Department allowance of drawback on cotton gin saws manufactured from imported sheet steel, covering saws 12½ in. in diameter, for which in liquidation the quantity of imported sheet steel which may be taken as the basis for the allowance of drawback may equal the quantity used as declared in the drawback entry, provided it shall not exceed one sheet of imported steel 50¼ in. long, 12½ in. wide and 0.037 in. thick for every four saws exported. There shall be deducted from this allowance the quantity of imported material which the valuable waste will replace, the quantity of waste being 29 per cent. and the value \$0.005 per lb.

Tempering Temperatures of Tools.

The General Electric Company's electrically heated oil tempering bath was described in *The Iron Age* of October 28, 1909, page 1311. In the *General Electric Review* for November H. Fulwider follows a description of this bath and of the tempering process with some notes on the temperatures at which different tools can best be tempered. The maximum energy consumption of these electrically heated baths for oil tempering is sufficient to heat the oil to a temperature of 450 degrees F. in less than an hour, starting cold. The article then says:

The maximum temperature which it is possible to obtain is about 600 degrees F., which is very close to the flashing point of the oil commonly used for tempering purposes. The following is a list of tools with the temperatures to which they should be raised in drawing the temper:

430 Degrees F.	
Scrapers for brass.	Ivory cutting tools.
Steel engraving tools.	Planer tools for iron.
Slight turning tools.	Paper cutters.
Hammer faces.	Wood engraving tools.
Planer tools for steel.	Bone cutting tools.
460 Degrees F.	
Milling cutters.	Chasers.
Wire drawing dies.	Punches and dies.
Boring cutters.	Penknives.
Leather cutting dies.	Reamers.
Screw cutting dies.	Half round bits.
Inserted saw teeth.	Planing and molding cutters.
Taps.	Stone cutting tools.
Rock drills.	
500 Degrees F.	
Gauges.	Wood boring cutters.
Hand plane irons.	Drifts.
Twist drills.	Coopers' tools.
Flat drills for brass.	Edging cutters.
530 Degrees F.	
Augers.	Cold chisels for steel.
Dental and surgical instruments.	Axes.
550 Degrees F.	
Gimlets.	Cold chisels for wrought iron.
Cold chisels for cast iron.	Molding and planing cutters to be filled.
Saws for bone and ivory.	Circular saws for metal.
Needles.	Screwdrivers.
Firmer chisels.	Springs.
Hack saws.	Saws for wood.
Framing chisels.	

The temperatures to which the above tools should be raised in tempering are all within the range of the electrically heated oil tempering bath.

Methods of Oil Tempering.

In shop practice there seems to be a difference of opinion in the matter of drawing the temper of tool steel, the point of contention being whether the steel should be gradually raised to the tempering point, or whether it should be plunged into a bath which is already at the tempering temperature.

This difference gives rise to two methods of oil tempering. The first is to bring the bath to a temperature of about 250 degrees F., then place the work in the bath and turn on full heat until the oil reaches the desired temperature, when the current is turned off and the work removed. If this procedure is followed, the steel, being introduced at a comparatively low temperature and then gradually heated to the proper point, is not subjected to any shock, and there is, therefore, no danger of injuring the quality of the tools.

The second method is to maintain the oil bath at the required temperature and plunge the steel into the oil, allowing it to remain there just long enough to acquire the same temperature evenly throughout the metal. The tools are then removed and a new lot is submerged.

By this latter method the process of tempering can be carried on without interruption, whereas in the first method it is necessary each time to cool the bath down to a temperature of about 250 degrees F. before introducing a new lot of steel, with a consequent decrease in output. Thus both methods have their advantages, but the one of gradual heating up involves no doubt as to the quality of the tool.

Control and Regulation.

The heating units of the electrically heated baths are connected in groups, arranged according to the size of the bath, and the leads brought out to the terminal block. The bath can then be used as a single heat device, or by running the leads to a switchboard designed for the purpose, it is possible to obtain a great number of temperatures. Where the tempering is done by gradually heating up the steel the single heat bath will do the work satisfactorily; but if it is desired to maintain a constant temperature it will be necessary to have the multiple heat bath, in which means are provided for varying the energy input by small steps, from zero to maximum. In the latter bath each group of units is controlled at the panel board by an individual switch, and any desired temperature is obtained by throwing in the number of units necessary to give that temperature approximately. Close regulation is then secured by varying the voltage impressed on one of the units, this being effected by means of a rheostat, also mounted on the controlling board.

Cyrus Elder's Poems.—Cyrus Elder, well known in the iron trade, with which he has been identified nearly all of the active part of his life, having been solicitor of the Cambria Iron Company for 33 years, is the author of a volume of poems just issued from the press of the J. B. Lippincott Company, Philadelphia, Pa., which has it on sale at \$1.25 per copy. The volume comprises 114 pages and is an excellent specimen of printing and binding. The poems number 46, covering a wide range of subjects, including Civil War themes, the author having seen active service as a Union soldier. They show a high order of poetic ability. Mr. Elder has been a versatile writer, having contributed much to protective tariff literature. He served for a number of years as secretary of the Industrial League, a national tariff organization of wide influence in its day. He is now retired, residing in Philadelphia.

The Citizens' Club of Chehalis, Wash., has issued a beautifully printed and illustrated brochure giving "a few pertinent facts" concerning that city, which is the county seat of Lewis County. The natural resources of the locality, the transportation facilities, the favorable climate and other advantages are attractively set forth with the purpose of inducing the location of factories and of business interests seeking an opportunity for expansion. The Citizens' Club is especially desirous of securing the location at Chehalis of factories to engage in the following lines: Woodworking plants, such as make furniture, split wood pulleys, broom handles, chairs, curtain rollers, ladders, fruit and berry boxes, excelsior, wood pulp paper, wood novelties, toys, &c.; clay working factories, especially those making pressed brick, vitrified paving brick and pottery; glove factories, tanneries, fruit and vegetable canneries, stove works, flax fiber factories, &c. The population of the city is approximately 5500. It is located on a railroad jointly owned by the Northern Pacific, Union Pacific and Great Northern companies. It is 94 miles south of Seattle and 91 miles north of Portland.

The Miami Valley Machine Tool Company, Dayton, Ohio, manufacturer of lathes, sensitive drills and grinding machines, should not be confounded with the Miami Valley Machine Company, Miamisburg, Ohio. The similarity of the names has led to annoying confusion. The officers of the Miami Valley Machine Tool Company are as follows: S. D. Conover, president; W. D. Foster, vice-president; P. P. H. Conover, secretary; David Wilson, manager.

Reports of the Board of Reviewers show that the Carnegie Steel Company pays about one-seventh of the entire taxes collected by the city of Youngstown, Ohio. The Ohio Works and the Union Mills of the Carnegie Steel Company in that city are assessed at \$4,652,580, while the total tax valuation of the city is put at about \$33,000,000.

NEWS OF THE WORKS.

Iron and Steel.

The American Steel & Tube Company, Lorain, Ohio, has completed the construction of its new mills, which will be placed in operation within 30 days. The company is under the control of the American Shovel & Stamping Company, and the plant will make sheets, plates and ultimately tubes for the shovel works. The mill building is 100 x 300 ft. and is equipped for rolling plates, sheets, angles, bars and round iron. The mill has two heating furnaces and one open hearth furnace.

The Pulaski Iron Company, Pulaski, Va., has completed repairs to its furnace, recently blown out, and started fire in it November 29.

The Richard Heckscher & Sons Company, Philadelphia, Pa., has completed repairs to its furnace at Swedeland, Pa., which has been out about five weeks for repairs. Fire was lighted in the stack on November 27.

Spang, Chalfant & Co., Inc., operating the Etna Iron & Tube Works in Pittsburgh, are making some extensive improvements to their works. In the pipe plant two new furnaces are being installed, and one, which will have a capacity of tubular goods up to 8 in. in diameter, will be completed in February. The second furnace, with a capacity up to 4 in. in diameter, will be ready for operation in July. In the 12-in. mill two modern heating furnaces to replace four old style furnaces are being installed by Wm. Swindell & Brothers. A new stock house, about 120 x 300 ft. in dimensions and of steel construction, is also under erection.

The plant of the Osterberg Tin Plate Company at Washington, Pa., recently bought by this concern and formerly known as the Washington Forge, Sheet & Tin Mills, was put in full operation November 29. The plant contains three sheet mills and four tin mills.

The Empire Steel & Iron Company, Catsauqua, Pa., has been putting its plant in shape for a busy season ahead, and will probably require considerable new equipment the coming year.

General Machinery.

New machinery for its crushing plant will be purchased by the Western Granite Company, St. Cloud, Minn.

The Keystone Auto Company, Uniontown, Pa., will purchase a milling machine, with motor for operating it, and an electric elevator.

Woodworking tools and power machinery are required by the Pacific Mfg. Company, Tacoma, Wash.

A new pumping plant will probably be installed in the spring at Florence, Colo., by the Colorado Fuel & Iron Company, Pueblo, preparations being now under way to secure a better supply of water for mining operations.

A modern factory with power plant in the subbasement and electric motor drive will be built at Indianapolis, Ind., by the Star Motor Car Company. Machine tool equipment is to be ordered in the near future.

Geo. H. Fruessing, Chicago, Ill., is in the market for three motor driven pumps.

A machine shop for repair work is being erected by the Weston Lumber Company, Westonla, Miss. Some light tools are required.

The Alton Shovel Company, Alton, Ill., will rebuild the foundry and shops recently burned. Machinery of the most modern design, including automatic transfers, will be installed throughout.

The Jones & Laughlin Steel Company, Pittsburgh, which has placed heavy orders for electric generating machinery to be installed in its new plant at Allquippa, will soon begin buying motors and other apparatus for the direct application of electric power.

Enlargement of the Newberry Machine Shops, Newberry, S. C., will be necessitated within a few months if business does not slacken, and the addition of some new machinery is contemplated to be made later on.

A pumping engine of about 3,000,000 gal. daily capacity will probably be purchased in the spring at Big Rapids, Mich.

Pumping machinery is to be bought shortly for the new water works at Mansfield, Ohio.

A triple expansion pumping engine of 12,000,000 gal. capacity in 24 hours will probably be installed during the coming year at Runyon, N. J. No bids have as yet been taken.

Some additional machinery will be added about January 15 to the crushing outfit of the Los Angeles (Cal.) Stone Company.

The Elmira Machine Works, Grover, Pa., is to move its plant to Union, where it has purchased a site of 2¼ acres fronting on the Erie Railroad tracks and extending between two streets. Contract for the new building has been let. The company has purchased a 40-hp. boiler, but has not yet arranged for the engine. The machinery will be electrically driven, a dynamo now on hand being used. At the new location the company will have better shipping facilities and a more modern shop to take care of its business.

The Connellsville Iron Works, Connellsville, Pa., is adding a new steel building to its plant, and is contemplating the purchase of a bull dozer punch and belt hammer.

The Garbutt Machine & Foundry Company has been incorporated at Ogdensburg, N. Y., with a capital stock of \$10,000, and will do an electrical and mechanical engineering business. The incorporators are Max A. Jameson, Myron E. Gray and Wm. O. Ingram, Ogdensburg.

The W. F. Norman Sheet Metal Mfg. Company, Nevada, Mo., is rebuilding the part of its plant recently destroyed by fire, the new structure to be 110 x 160 ft. The portion burned was the old part of the plant, the new two-story brick addition, which was not quite finished, was not damaged to any extent. The company will need considerable new machinery for the new building, but at the present time has not decided just what it will purchase.

The Sapulpa Iron Works, Sapulpa, Okla., recently incorporated with capital stock of \$50,000, states that the machine department of its works will be ready for operation within the next 10 days.

The Harry Brothers Company, New Orleans, La., tank manufacturer, is in the market for a riveter and sheet metal corrugator. J. S. Cave, general manager, will be at the Seville Hotel, New York, until December 5.

The Kansas City Steel Scraper Company, Kansas City, Mo., has been organized to take over the business of the Slusser-McLean Scraper Company of Sidney, Ohio. The new company has purchased 30 acres of ground at Steelton, Kansas City, Mo., where it will erect a new plant to consist of 11 buildings of fire-proof construction, having steel frames, brick walls, metal skylights and concrete floors. The new plant will have a daily capacity of five carloads of steel scrapers, trucks, &c., in addition to the output of the car shops. The estimated cost of the new buildings and equipment is \$750,000. The company is not yet ready to take bids on the machinery or supplies that will be required for the new plant, and probably these will not be taken up until the contract for the buildings has been let. Edwin N. Miller is president, William McLean vice-president, D. B. Wallis, treasurer, and Amos Townsend secretary.

Bridges and Buildings.

Contract for a new steel bridge to be built over the Jordan River at Riverton, Utah, has been let to the Midland Bridge Company, Kansas City, Mo.

Foundries.

It is reported from Brainerd, Minn., that the Northern Pacific Railroad will build a foundry there.

It is reported from Des Moines, Iowa, that James Green of that city will erect a foundry.

The Dothan Foundry & Machine Company, Dothan, Ala., will find it necessary before long to provide for additional capacity, and some new equipment may be bought within the next three months.

The Berkley Foundry & Structural Company has been organized at Norfolk, Va., by W. H. C. Deal and others.

The Michigan Malleable Iron Company, Detroit, Mich., will install additional motors of large size.

The Woods-Evertz Stove Company, Springfield, Mo., is erecting a two-story building at a cost of \$3500, to be used for pattern and casting rooms.

Power Plant Equipment.

Plans are being prepared for a municipal power and lighting station at Lafayette, Ga.

The electric power plant to be built at Watertown, S. D., by Ferris Bros. will be designed for large capacity, and generating machinery is to be purchased in the near future.

A pumping engine, or centrifugal pump motor driven, will be bought shortly by the city of Hancock, Mich., if the recommendation recently made by the Board of Public Works is carried into effect.

The Ft. Payne Fuel & Iron Company, Ft. Payne, Ala., has had plans prepared for a new electric power plant.

A small electric generator and other apparatus for its mill will be purchased by the Rockton Paper Company, Rockton, Ill.

A power plant and pumping station for water works will be built at Clendenin, W. Va., by the Clendenin Water, Light & Fuel Company, recently incorporated, which will also undertake industrial developments in the vicinity.

An electric generating station is being planned for the Meriden, Middletown & Guilford Railroad, Meriden, Conn., construction work upon which will begin about February 1. Equipment details have not yet been worked out.

The Minneapolis Steel & Machinery Company has the contract for a gas producer and gas engine to be installed in the electric power plant at Milbank, S. D.

Control of the Aberdeen Electric Light & Power Company, Aberdeen, S. D., having passed to an Omaha syndicate, the electric generating plant will be thoroughly modernized by the erection of new dynamo units. A producer gas engine installation will also be considered.

The N. K. Fairbank Company, Gretna, La., will require some additional power apparatus and special machinery in connection with one or two new factory buildings the erection of which is contemplated.

A pumping station will be built at Thorndale, Texas, by the Thorndale Water Company, which has just been organized by J. A. Lehman and others.

The Athens Electric Railway Company, Athens, Ga., which generates current at both steam and hydro-electric plants, is about to undertake another water power development of 3000 kw. at Barnett Shoals. Specifications covering the new machinery required have not yet been prepared.

A small municipal power plant for lighting service is to be built at Arlington, S. D.

Water works and an electric power plant will be built by the city of Pella, Iowa.

A large steam generating and heating plant is to be constructed by the R. J. Reynolds Company, Winston-Salem, N. C.

Some additional apparatus for its power house will be purchased early in the coming year by the Beaver Valley Traction Company, Beaver Falls, Pa.

A new Corliss engine or steam turbine is to be purchased within a short time for the power house of the Alvin Electric Company, Alvin, Texas, control of which was recently acquired by Geo. E. Rowen.

The Madill-Shroyer Engine Company has been organized at St. Louis, Mo., by Oliver H. Shroyer and others.

An electric power station and pumping plant will be constructed at Oakley, Kan., where the authorities have ordered plans to be drawn.

Water works and a municipal lighting system have been decided upon at Apache, Okla., and specifications covering the machinery required will be completed in the near future.

Some improvement will be made this winter in the equipment of the municipal lighting station at Farmer City, Ill.

Alternating current generators having an aggregate capacity of about 1500 hp., with auxiliary machinery, will be added to the power plant of the Detroit Copper & Brass Rolling Mills, Detroit, Mich. Steam turbines will be used for operating them.

The project for a modern pumping station at Benton Harbor, Mich., drawing water from Lake Michigan, which was referred to recently in this paper, is rapidly reaching a head. Boilers, heater, feed pumps and an engine of large capacity will be among the requirements of the new station, unless it is decided to substitute gas power for steam.

Machinery will be contracted for at Erie, Kan., about January 1, for a combined electric power plant and pumping station, the plans of which have already been prepared.

Plans for the electric lighting plant at Pocomoke, Md., recently mentioned, have been prepared by Theo. W. Pitesch, engineer, Baltimore, and specifications covering the machinery will soon be ready.

If reorganization is effected, as at present proposed, a large steam turbine power station will be built for the Findlay-Marion Railway & Light Company at a location central between Toledo and Columbus, Ohio.

A producer gas plant and engines of 125 to 150 hp. capacity will be installed by the Rogers & Hubbard Company, Portland, Conn.

The new steam power plant of the Winchester & Washington City Railroad at Millville, Va., to which reference was recently made in this paper, will be designed in detail by January 1 and the company will then be ready to purchase machinery. Inquiries for specifications should be addressed to Winchester, Va.

A power plant is to be erected at Islip, N. Y., by the Islip Electric Light Company, recently organized.

An electric power plant of small capacity will probably be built in the spring by the Village Board at Palermo, N. D.

Some electrical machinery will be required this winter by the Darlington Water & Electric Company, Darlington, S. C. For further information address A. P. Malone, president.

Upon completion of an extension which it proposes to build to Nacoochee Valley, the Clarksville (Ga.) Railroad will enlarge its power equipment. A turbine unit is being considered.

The construction of a municipal power plant is being considered at Strawberry Pt., Iowa.

A company now being organized by W. B. Ferguson, Waynesville, N. C., will undertake the building of a hydro-electric plant to develop 500 kw., with which to supply industries in the vicinity with alternating current for motor drive.

A large hydro-electric power development is being undertaken by the Crook County Water, Light & Power Company, Prineville, Ore., at the Oden Falls, to furnish current for operating a traction line. Machinery requirements are not stated.

The largest municipal power project in the country has been practically decided upon by the city of Tacoma, which is to have plans prepared for a hydro-electric plant at Nisqually, Wash. Machinery requirements will inevitably be very heavy, but some time must elapse before specifications are drawn.

A large hydro-electric power plant will be built in the vicinity of Thompson, Minn., by Senator Edward Donlan and others, who are now organizing a company for the purpose.

Plans are in course of preparation for a pumping station and water distributing system to be installed at Collinsville, Okla., where a large bond issue was recently voted for the purpose.

An electric generating station operated by impulse turbines will be built in the vicinity of Sheridan, Ill., by the Fox River Hydro-Electric Company, recently incorporated. Machinery requirements have not yet been formulated.

The Geneva & Auburn Railroad Company, Seneca Falls, N. Y., will build a steam turbine power plant of about 1500 kw. to provide for operating a 15-mile extension, among the requirements of which will also be a steel-concrete bridge nearly $\frac{1}{4}$ mile long.

Canadian, Texas, is having plans prepared for the construction of an electric light plant. C. W. Conrad, Topeka, Kan., is engineer in charge.

The Frisco Mines & Power Company, Kingman, Ariz., will erect a power plant on its property on the Colorado River.

The Chippewa River Power Company, Saginaw, Mich., has appropriated \$1,200,000 for improvements to its plant. W. F. Davidson, Port Huron, Mich., is vice-president.

The Clinton Iron & Steel Company, Pittsburgh, has placed a contract for two blowing engines with the Southwark Foundry & Machine Company of Philadelphia. The latter company has also received an order for a vertical cross compound engine for the Wisconsin Steel Company.

James E. McNary, sales representative for Clark Bros., Belmont, N. Y., has received an order from the American Metal Mold Company, Economy, Pa., for a 200-hp. Clark duplex gas engine for direct connection to a 125-kw. generator.

The Evansville Public Service Company has been organized at Evansville, Ind., with \$1,000,000 capital stock to establish a central electric light, power, steam and hot water plant. C. A. Gillham, secretary and general manager of the Central Station Engineering Company of Chicago, is representing the company in its application for a 25-year franchise at Evansville.

The city of Casey, Ill., will construct a pumping plant to furnish water for the city.

It is reported that Ed. Donlon, Missoula, Mont., will erect an electric power plant at Thompson Falls, to cost \$1,000,000.

The city of Stillwell, Okla., has engaged the O'Neil Engineering Company, Dallas, Texas, to prepare plans for an electric light plant to cost \$51,000. J. W. Patton is city clerk.

Oakley, Kan., is having plans prepared for the construction of a water works system and an electric light plant to cost \$35,000. Burns & McDonnell, Kansas City, Mo., are consulting engineers.

Burns & McDonnell, Scarritt Building, Kansas City, Mo., are preparing preliminary plans for the construction of a water works system and electric light plant for Colby, Kan., to cost \$45,000.

Miscellaneous.

The water works at Douglas, Ariz., which are owned by a public service corporation, will be purchased by the city and considerably improved. This means the buying, later on, of some new machinery.

Improvements, which will include some new machinery, are to be made to the water works system at Highland Park, Mich.

The Locomobile Company of America, Bridgeport, Conn., is having plans prepared for an addition to its plant at Seaside Park. Lockwood, Green & Co., Boston, have charge of the work. A steam turbine unit may be installed.

Pumping machinery will be bought next week by the authorities at Okeene, Okla., for a new system of water works, the plans for which have been drawn by Archer, Rollins & Co., Kansas City.

Rogers, Brown & Co. will install additional machinery for operating its Kennedy iron mine at Cayuna, Minn., and work on the Cayuna Iron Range Railroad, owned by that firm, is being pushed.

The building of a pumping plant and installation of water works is under consideration by the town authorities at New Baden, Ill.

The Treport Auto Gasoline Engine Company, now of Rochester, N. Y., will build a new plant at Columbia City, Ind.

The Wayne Auto-Axle Company, Fort Wayne, Ind., has been incorporated with capital stock of \$100,000, to manufacture a patent automobile axle. The company has purchased the building and grounds of the Fleming Mfg. Company and is installing the necessary equipment. The directors of the company are A. B. White, James Keenan, Edward White and Harry Sprague.

Fire service pumps for use in connection with steel storage tanks and a sprinkler system will be required shortly by the Summit Thread Company, East Hampton, Conn.

Some new machinery may be purchased after January 1 by the Citizens Water Works Company, Quincy, Ill., which is planning the enlargement of its plant.

Coke ovens, with a gas-electric power plant in which the engines are run on the waste gas from the ovens, will be built at Frank, Alberta, Canada, by the Canadian-American Company.

Additional deep well pumps will probably be purchased after January 1 by the Anderson Water & Light Company, Anderson, S. C.

Extensive improvements to the water works system, including installation of additional machinery, will be undertaken in the spring at Council Bluffs, Iowa.

A mechanical filtration plant of the most modern design has been authorized for construction by the municipality at Jackson, Miss., and a similar project will probably be put through at Ardmore, Okla.

A system of natural and mechanical pressure filtration, with machinery similar to that recently installed at New Orleans, will probably be adopted in the near future by Sacramento, Cal., where Prof. C. G. Hyde of Berkeley has been retained to prepare plans.

The Republic Iron & Steel Company has arranged for the construction of a large heating plant in connection with its properties at Gilbert, Minn.

A plant will be erected at Long Beach, Cal., by the Los Angeles Switch & Signal Company. The details of the equipment have not yet been decided upon.

Cottage Grove, Ore., has decided upon an appropriation of \$100,000 for the remodeling and extension of its water pumping system.

A factory will be built at Des Moines, Iowa, by the National Seed Tester Company.

Municipal water works are proposed for East Alton, Ill., and preliminary plans for a pumping station will be prepared shortly.

The Alton Tool Handle Company, Alton, Ill., will remodel its plant and extend electric motor drive throughout.

The Haysler Mfg. Company, Clinton, Mo., has been incorporated, with a capital stock of \$30,000, to manufacture metal specialties. G. C. Haysler is president, F. P. Kitchen vice-president and A. C. Haysler secretary. The equipment has been purchased.

The city of Sentinel, Okla., is having plans prepared for the construction of a water works system which will cost \$15,000. Address J. E. Deaton for further information.

The Hastings Automatic Shock Loader Company, Hastings, Neb., incorporated with capital stock of \$100,000, is erecting a new factory building, 38 x 100 ft. The present plans call for one floor, but the building will be so constructed that additional floors and extensions may be added when necessary. The company has a large stock of raw material on hand needed in the manufacture of the loaders, and a force of men will be employed to work on the machines as soon as the building is completed. In its former quarters the company was unable to manufacture for general sale, and for this reason orders were not solicited, but there will be a limited number of machines ready for shipment in the spring.

The Wheeling Stamping Company, Wheeling, W. Va., has recently torn down a couple of its old buildings adjoining its plant and has awarded a contract to Kaiser & McClain, Bellaire, Ohio, for a three-story concrete and steel building, 66 x 120 ft., to be erected on the site. The company has for some time been crowded in some of its departments, and to provide for this decided to erect a new building, which it expects to have ready for machinery about April 1, 1910. The capacity will be increased about one-third.

The Iron City Coal & Coke Company, Pittsburgh, has renewed its contract with the Mond Nickel Company, Victoria Mines, Ontario, for supplying it with its entire requirements of furnace coke for the first half of 1910. Shipments will amount to from 50 to 100 tons daily.

Walter O. Amsler, Wabash Building, Pittsburgh, is completing two Amsler standard gas producers for the South Indiana Glass Company, Logansport, Ind., and has under construction two more of the same type, but using the double flue systems, for the Foster Glass Company, Moundsville, W. Va. The advantage of the latter type is in their being able to run continuously, one flue being cleaned out while the other is operating.

The American Bridge Company, Pittsburgh, has received an order from the United States Government for four all-steel barges for use on the Mississippi River, the barges to be delivered at Vicksburg, Miss. The barges will cost nearly \$40,000, and the contract is one of the largest of its kind placed for some months.

The United States Pump & Tank Company, St. Louis, Mo., has been incorporated with capital stock of \$3000 to manufacture and deal in pumps and tanks. The incorporators are John J. Behen, Fred F. Davis, Claude G. Holt, S. T. G. Smith and S. F. Behen.

The Kohl Mfg. Company has been incorporated at Indianapolis, Ind., with \$10,000 capital stock to manufacture automobile accessories. The directors are John A. Aaron and Martin F. Kohl.

The Becker Wagon Works has been incorporated at Evansville, Ind., with \$45,000 capital stock to manufacture vehicles.

The incorporators are D. G. Becker, Azro Dyer and H. P. Peck-Inbaugh.

The Auto Crank Shaft Company, Detroit, Mich., T. F. Ahern, manager, 192-196 Piquette avenue, has awarded contracts for the erection of a two-story factory building, 70 x 140 ft., of brick and steel construction.

The Detroit Gear Grinding Company is erecting a factory, 62 x 104 ft., two stores, of reinforced concrete at East Grand boulevard and Chene street.

The Aluminum Company of America, Pittsburgh, Pa., and Niagara Falls, N. Y., has received contract from the Ontario Hydro-electric Commission for 1,500,000 lbs. of 1/4-in. aluminum wire to be used for transmission lines for the distribution throughout the Province of Ontario of electricity generated at Niagara Falls. The amount of the contract approximates \$400,000.

Broken Arrow, Okla., has engaged Archer Rollins & Co., consulting engineers, Kansas City, Mo., to prepare plans for a water works system, to cost about \$30,000.

J. C. Denious, city clerk, Erie, Kan., will soon receive bids for the construction of a water works system, contract for which will be awarded December 20. Burns & McDonnell, Kansas City, Mo., are consulting engineers.

Aurora, Minn., will construct a water works system to cost \$14,000. C. H. Graham is village recorder and E. Wallgren engineer.

Iron Ore and Shipping Interests to Build a Sailors' Institute.—Cleveland iron ore and shipping firms are actively interested in the establishment in that city of a sailors' institute to cost \$350,000. The committee on ways and means consists of Samuel Mather, Pickands, Mather & Co.; E. W. Oglebay, Oglebay, Norton & Co.; W. G. Pollock, Jones & Laughlin Ore Company; H. Coulby, Pittsburgh Steamship Company; D. R. Hanna, M. A. Hanna & Co.; J. H. Sheadle, Cleveland-Cliffs Iron Company; Gen. George A. Garretson. The project contemplates raising the amount named by subscription and constructing and equipping an institute in which will be provided reading rooms, recreation, baths, an assembly room for meetings and classes of instruction; also a number of sleeping rooms. During the closed season it is proposed to have lectures in engineering and navigation.

The Electrical Steel Company of Canada, recently chartered by the Dominion Government, with head office in Toronto and a branch office in Buffalo, has secured a large site at Welland, Ont., on the Welland Canal, with railroad facilities, for the construction of a plant for the smelting of iron ores and the refining of steel by electricity. The electrolytic process will be used, by which the ore is reduced with hydrogen at a dull red heat, titaniferous and pyrite ores being utilized. Induction furnaces will be installed for making refined irons. The initial plant of 1000 hp. will be ready for operation within a few weeks. In this plant the commercial possibilities of the press will be fully demonstrated, after which it is planned to erect a very much more extensive plant, which will require 50,000 hp. for its operation. The cost of its construction and equipment is estimated at \$1,000,000. Niagara Falls power will be used. Branch plants will also be established at different points in the United States and Canada, where electrical power at a minimum cost can be readily obtained. The officers of the company are as follows: Tyson S. Dines, St. Louis, Mo., president and treasurer; George G. Goodrich, Saratoga, N. Y., vice-president; A. S. Ramage, Buffalo, N. Y., secretary, assistant treasurer and manager. The last named invented the process and designed the plant.

The American Specialty Company, Monadnock Building, Chicago, has been appointed sole export agent for the line of portable electric drilling machines manufactured by the Van Dorn Electric & Mfg. Company, Cleveland, Ohio. The American Specialty Company also has the agency for these tools in the Chicago and Central Western districts.

The American Institute of Chemical Engineers calls attention to a change in the title of the paper to be read at its annual meeting at Philadelphia, December 8 to 10, by Edward R. Taylor. The paper will be entitled "A Method for Smelting Iron Ore in the Electric Furnace."

The Iron and Metal Trades

Eastern Basic Iron Again Active.

Finished Material Orders Slightly Less.

With the capacity of mills and furnaces taken up for months ahead the iron trade is yet scanning the situation with the greatest care for the first signs of counter-currents. There is more disposition to question how this or that development will affect business, and executive and legislative programmes are figuring more largely in forecasts.

A significant indication as to mill order books is the strictness governing the taking of new business, particularly in bars, plates and structural shapes. The steel companies generally are instructing salesmen to accept no business for the first half of 1910 without referring all details to general sales offices. Probably no such care has ever been taken to guard against overselling or the placing of business beyond the needs of the buyer.

While new orders for finished steel came in through most of November at a greater rate than in October, the past week has shown a slight slackening of the pace, though it still means that the mills are falling farther behind each day.

In production, both of pig iron and finished material, the Steel Corporation last month fell behind its October record, both in total and in daily rate. Of blast furnace products its subsidiaries turned out about 1,180,000 gross tons, or 55,000 tons less than in October, and of ingots, 1,335,000 gross tons, or 75,000 tons less.

Car builders are steadily requiring more steel and plate mills are feeling the pressure. Railroads are getting ready some further large car orders which are expected within the month. The Santa Fe contract for 10,000 cars went to the American Car & Foundry Company.

There is no let-up in structural work. For the Whitehall Building addition in New York, the fabricating of 9500 tons of steel will be done by an Indiana plant. The Pittsburgh & Shawmut is in the market for 6000 tons of bridge work, and the Delaware & Eastern for 3500 tons.

The starting of the bar mill at Gary, Ind., will give much needed relief in that product. While new bar orders are not as heavy as in recent months, specifications have not been equalled.

The applications for work from striking sheet and tin plate workers in the Wheeling District may lead to the starting of the one sheet mill and two tin plate mills that have long been idle. In both sheets and tin plates the possible production in the first half of 1910 has very largely been taken up, and some mills are booked into the third quarter.

Sales of forging billets in several thousand ton lots have been made in the East for shipment to Central Western works, prices at Eastern mill ranging from \$32 to \$34. Rolling billets are quoted at \$27.50, Pittsburgh, and \$30 at Eastern mill.

The pig iron market has developed new activity in steel making iron, contrasting with continued quietness in foundry grades. Eastern steel works have bought 46,000 tons of basic iron in the past week, for the first quarter and first half of 1910, the greater portion at \$18.75, delivered. One Eastern pipe works has taken 5000 tons, chiefly gray forge.

Two sales of 10,000 tons each of Bessemer iron are reported from the Central West at \$19, at Valley furnace.

The Southern pig iron market for the time being is in the hands of speculators whose warrant holdings turn out to be considerably more than has been commonly supposed. While \$14 No. 2 iron can be found without difficulty for early delivery, sellers generally hold for \$15 for next year's delivery. Some inquiries are coming out for foundry iron for the second and third quarters of 1910, and in some cases for the whole year.

The leading seller of Eastern iron ore has opened its books for 1910, the prices named being about 40 cents above the average for 1909. The amount available is about 1,000,000 tons, with the demand likely to exceed the supply. The probability of a 25-cent advance in non-Bessemer and 50 cents in Bessemer ores for 1910 is now discussed in lake ore circles.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

Dec. 1, Nov. 24, Nov. 3, Dec. 2,
1909. 1909. 1909. 1908.

PIG IRON, Per Gross Ton :				
Foundry No. 2, standard, Philadelphia	\$19.00	\$19.00	\$19.00	\$17.25
Foundry No. 2, Southern, Cincinnati	17.75	17.75	17.75	16.25
Foundry No. 2, local, Chicago ..	19.00	19.00	19.00	17.35
Basic, delivered, eastern Pa.	18.75	18.75	19.00	16.50
Basic, Valley furnace	17.25	17.25	17.25	15.50
Bessemer, Pittsburgh	19.90	19.90	19.90	17.40
Gray forge, Pittsburgh	17.40	17.40	17.15	15.15
Lake Superior charcoal, Chicago	19.50	19.50	19.50	19.50

BILLETS, &c., Per Gross Ton :				
Bessemer billets, Pittsburgh ..	27.50	27.50	27.00	25.00
Forging billets, Pittsburgh	31.00	31.00	30.00	27.00
Open hearth billets, Philadelphia	30.60	30.60	30.60	26.20
Wire rods, Pittsburgh	33.00	33.00	32.00	33.00
Steel rails, heavy, at mill	28.00	28.00	28.00	28.00

OLD MATERIAL, Per Gross Ton :				
Steel rails, melting, Chicago ..	17.25	17.25	17.25	15.50
Steel rails, melting, Philadelphia	18.00	18.00	18.00	16.25
Iron rails, Chicago	20.00	19.50	20.50	19.50
Iron rails, Philadelphia	21.00	21.00	21.00	20.50
Car wheels, Chicago	18.50	18.50	18.50	16.00
Car wheels, Philadelphia	17.50	17.50	17.50	16.00
Heavy steel scrap, Pittsburgh ..	17.50	17.50	17.50	16.50
Heavy steel scrap, Chicago	16.00	16.00	16.00	15.25
Heavy steel scrap, Philadelphia.	18.00	18.00	18.00	16.25

FINISHED IRON AND STEEL,				
Per Pound :	Cents.	Cents.	Cents.	Cents.
Refined iron bars, Philadelphia.	1.65	1.65	1.62	1.50
Common iron bars, Chicago ..	1.60	1.60	1.55	1.50
Common iron bars, Pittsburgh ..	1.70	1.70	1.60	1.50
Steel bars, tidewater, New York.	1.66	1.66	1.66	1.56
Steel bars, Pittsburgh	1.50	1.50	1.50	1.40
Tank plates, tidewater, New York	1.71	1.71	1.66	1.76
Tank plates, Pittsburgh	1.55	1.55	1.50	1.60
Beams, tidewater, New York ..	1.71	1.71	1.66	1.76
Beams, Pittsburgh	1.55	1.55	1.50	1.60
Angles, tidewater, New York ..	1.71	1.71	1.66	1.76
Angles, Pittsburgh	1.55	1.55	1.50	1.60
Skelp, grooved steel, Pittsburgh.	1.55	1.55	1.45	1.45
Skelp, sheared steel, Pittsburgh.	1.60	1.60	1.55	1.50

SHEETS, NAILS AND WIRE,				
Per Pound :	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.30	2.30	2.30	2.50
Wire nails, Pittsburgh	1.80	1.80	1.80	1.95
Cut nails, Pittsburgh	1.80	1.80	1.80	1.75
Barb wire, galv., Pittsburgh ..	2.10	2.10	2.10	2.40

METALS, Per Pound :				
	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	13.75	14.00	13.25	14.50
Electrolytic copper, New York ..	13.25	13.75	12.87½	14.25
Spelter, New York	6.40	6.40	6.30	5.20
Spelter, St. Louis	6.25	6.25	6.10	5.05
Lead, New York	4.40	4.40	4.40	4.35
Lead, St. Louis	4.25	4.27½	4.25	4.20
Tin, New York	31.75	31.30	30.40	29.40
Antimony, Hallett, New York ..	8.12½	8.25	8.25	8.12½
Nickel, New York	45.00	45.00	45.00	45.00
Tin plate, 100 lb., New York ..	\$3.84	\$3.84	\$3.74	\$3.89

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel F.O.B. Pittsburgh.

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Structural Shapes.—I-beams and channels, 3 to 15 in., inclusive, 1.55c., net; I-beams over 15 in., 1.65c., net; H-beams over 8 in., 1.75c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.60c., net; angles, over 6 in., 1.65c., net; angles, 3 x 3 in. and up, less than ¼ in., 1.75c., base, half extras, steel bar card; tees, 3 in. and up, 1.65c., net; zeos, 3 in. and up, 1.60c., net; angles, channels and tees, under 3 in., 1.50c., base, plus 10c., half extras, steel bar card; deck beams and bulb angles, 1.80c., net; hand rail tees, 2.80c., net; checkered and corrugated plates, 2.80c., net.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.55c. to 1.60c., base. Extras over this price are as follows:

Tank, ship and bridge quality, ¼-in. thick on edges, 100 in. wide, down to but not including 6 in. wide, is taken as base.

Steel plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, shall be considered $\frac{1}{4}$ -in. plate. Steel plates over 72 in. wide must be ordered $\frac{1}{4}$ -in. thick on edge, or not less than 11 lb. per square foot, to take base price. Steel plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. shall take the place of 3-16-in.

Percentages as to overweight on plates, whether ordered to gauge or weight, to be governed by the Association of American Steel Manufacturers' Standard Specifications.

Gauges under $\frac{1}{4}$ -in. to and including 3-16-in. plates on thin edges.....	\$0.10
Gauges under 3-16-in. to and including No. 8.....	.15
Gauges under No. 8 to and including No. 9.....	.25
All sketches (excepting straight taper plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.).....	.10
Complete circles.....	.20
Roller and flange-steel plates.....	.10
"A. B. M. A." and ordinary firebox steel plates.....	.20
Still bottom steel.....	.30
Marine steel.....	.40
Locomotive firebox steel.....	.50
Shell grade of steel is abandoned.	
For widths over 100 in. up to 110 in.....	.05
For widths over 110 in. up to 115 in.....	.10
For widths over 115 in. up to 120 in.....	.15
For widths over 120 in. up to 125 in.....	.25
For widths over 125 in. up to 130 in.....	.50
For widths over 130 in.....	1.00

TERMS.—Net cash 30 days. Pacific Coast base, 1.30c. f.o.b. Pittsburgh.

Sheets.—Minimum prices for mill shipments on sheets in carload and larger lots, effective from November 11, on which jobbers charge the usual advances for small lots from store, are as follows: Blue annealed sheets, Nos. 3 to 8, 1.70c.; Nos. 9 and 10, 1.75c.; Nos. 11 and 12, 1.80c.; Nos. 13 and 14, 1.85c.; Nos. 15 and 16, 1.95c. Box annealed sheets, Nos. 17 to 21, 2.20c.; Nos. 22 to 24, 2.25c.; Nos. 25 and 26, 2.30c.; No. 27, 2.35c.; No. 28, 2.40c.; No. 29, 2.45c.; No. 30, 2.55c. Galvanized sheets, Nos. 13 and 14, 2.50c.; Nos. 15 and 16, 2.60c.; Nos. 17 to 21, 2.75c.; Nos. 22 to 24, 2.90c.; Nos. 25 and 26, 3.10c.; No. 27, 3.30c.; No. 28, 3.50c.; No. 29, 3.60c.; No. 30, 3.85c. Painted roofing sheets, No. 28, \$1.70 per square. Galvanized roofing sheets, No. 28, \$3 per square, for $2\frac{1}{2}$ -in. corrugations.

Wrought Pipe.—We quote the following official discounts on merchant pipe, subject to the usual additional discounts to largest buyers:

	Steel. Black. Galv.	Iron. Black. Galv.
$\frac{1}{8}$ and $\frac{1}{4}$ in.....	71 55	65 52
$\frac{3}{8}$ in.....	72 58	66 52
$\frac{1}{2}$ in.....	75 63	69 57
$\frac{3}{4}$ to 6 in.....	79 69	73 63
7 to 12 in.....	74 59	68 53
Plugged and Reamed.		
1' to 4 in.....	77 67	71 61
Extra Strong, Plain Ends.		
$\frac{1}{8}$ to $\frac{3}{8}$ in.....	64 52	58 46
$\frac{1}{2}$ to 4 in.....	71 59	65 53
$\frac{3}{4}$ to 8 in.....	67 55	61 49
Double Extra Strong, Plain Ends.		
$\frac{1}{2}$ to 8 in.....	60 49	54 43

Boiler Tubes.—We quote the following official discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads:

	Steel.	Iron.
1 to $1\frac{1}{2}$ in.....	49 43	
$1\frac{1}{2}$ to $2\frac{1}{4}$ in.....	61 43	
$2\frac{1}{4}$ in.....	63 48	
$2\frac{3}{4}$ to 5 in.....	69 55	
6 to 13 in.....	60 43	

$2\frac{1}{2}$ in. and smaller, over 18 ft., 10 per cent. net extra.

$2\frac{3}{4}$ in. and larger, over 22 ft., 10 per cent. net extra.
To destinations east of the Mississippi River will be sold at delivered discount for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer, open hearth and chain rods, \$33.

Steel Rivets.—Structural rivets, 2.05c., base; boiler rivets, 2.15c., base, subject to usual extras.

Chicago.

FISHER BUILDING, December 1, 1909.—(By Telegraph.)

New business placed with the steel mills in the Chicago District during November was far in excess of their monthly capacity, following a similar accumulation during October. This condition would be alarming to buyers if it were not for qualifications of this statement, which afford some hope for the future. Rail orders have been taken during this period for deliveries through the entire year, and many large contracts for other material call for deferred deliveries, as, for example, the St. Louis bridge, on which the first pier will not be ready until next August. There is no immediate danger of a famine in bars with the new Gary mills coming in at an early date, and on sheets and other articles of general consumption the mills, although well sold up through the first half, are apparently able to take care of the demand. The severe congestion is in a few lines, like plates and structural shapes, where the number of buyers is small and the amount of each order large. Car orders like the one just placed by the Santa Fe Railroad call for an enormous tonnage of plates, this particular order requiring about 150,000 tons of steel. The railroads will have to wait for steel cars until the mills can furnish the material or until the capacity can be expanded to meet this new demand from Western

roads. Investors in new steel frame buildings will also have to await their turn at the structural mills and fabricating shops. The mill managers have been very careful during recent months not to commit themselves on speculative contracts for material of general consumption, and by this policy, which is to be commended, they have been able to take fairly good care of the consumptive demand. While it is unfortunate that a few large consumers cannot get steel as fast as desired, it is better that they should wait than the multitude of smaller consumers, and meantime the mills have an enormous tonnage of deferred business which will carry them safely over any reaction during the next year in the demand for lighter products. For the present, however, the market continues very strong in all branches of finished products, and even the scrap trade shows signs of improvement after the severe attack of indigestion that has prevailed the past month. Coke continues strong.

Pig Iron.—November has been a remarkable month in the pig iron market in contrast with the activity which prevailed in August, September and October. The Northern furnace interests are viewing the situation comfortably, as they have little spot iron to sell and the lack of inquiries is not felt. In Southern grades the leading furnaces are apparently taking the same view of the market, and promptly decline any orders for first quarter or half at less than \$15, Birmingham. The holders of resale iron, however, are very persistent in their efforts to find buyers. A revised estimate this week of the amount of resale iron held at Southern furnace yards places the total at about 85,000 tons, but much of it is held in small lots, and the inability of the holders to realize seems to make them all the more determined in their efforts. In many cases one small lot is offered through several brokers who canvass the country, and it is possible that buyers may thus have an exaggerated impression of the amount of this iron available. It is believed that these stocks of resale iron would not last a week in a good active market. It is conceded by the furnace interests, however, that foundrymen have generally covered their requirements through the first quarter and many of them through the first half, and a return of general activity in the demand is not expected for some time. The current price of resale iron for prompt shipment is \$14.50, Birmingham, for No. 2 foundry, although it is reported that lower prices have been considered on small lots of spot iron. The following quotations are for December delivery, f.o.b. Chicago:

Lake Superior charcoal.....	\$19.50 to \$20.00
Northern coke foundry, No. 1.....	19.50 to 20.00
Northern coke foundry, No. 2.....	19.00 to 19.50
Northern coke foundry, No. 3.....	18.50 to 19.00
Northern Scotch, No. 1.....	19.00 to 19.50
Southern coke, No. 1.....	19.35 to 19.85
Southern coke, No. 2.....	18.85 to 19.35
Southern coke, No. 3.....	18.35 to 18.85
Southern coke, No. 4.....	18.35 to 18.85
Southern coke, No. 1 soft.....	19.35 to 19.85
Southern coke, No. 2 soft.....	18.85 to 19.35
Southern gray forge.....	17.85 to 18.35
Southern mottled.....	17.60 to 18.10
Malleable Bessemer.....	19.00 to 19.50
Standard Bessemer.....	21.40 to 21.90
Jackson Co. and Kentucky silvery, 6%.....	20.40 to 20.90
Jackson Co. and Kentucky silvery, 8%.....	21.40 to 21.90
Jackson Co. and Kentucky silvery, 10%.....	22.40 to 22.90

(By Mail.)

Billets.—There is no change in the situation regarding forging billets in this market. Consumers whose wants are not covered find it necessary to watch the offerings by Eastern mills.

Rails and Track Supplies.—Orders for standard rails taken here last week amounted to about 30,000 tons. The mills are booked so far through next year on both Bessemer and open hearth rails that there is every indication of a year's operation at full capacity. In track supplies the business has been unusually heavy this fall. October bookings were the largest in years, and November runs close to the October record in orders and specifications. One railroad recently specified 10,000 tons in one lot on a contract placed last fall. In track bolts and spikes the actual sales of the past two months have been about three times the capacity of the mills of this district for the same period, but these orders, of course, cover requirements extending a considerable period into the future. The open weather keeps up the strenuous demand for prompt shipments, and it is difficult to satisfy the roads in this respect. We quote standard railroad spikes at 1.80c., base; track bolts and square nuts, 2.30c. to 2.50c., base, all in car lots, Chicago. Light rails, 40 to 45 lb., \$26; 30 to 35 lb., \$26.75; 16, 20 and 25 lb., \$27; 12 lb., \$28, Chicago, less 50c. a ton on lots of 500 tons and \$1 a ton on lots over 500 tons.

Structural Material.—The past week has been relatively light in new contracts and lettings. The American Bridge Company booked 4500 tons for two buildings at Los Angeles, Cal., one being the 10-story Chester office building and the other the Alexandria Hotel. The Chicago & Northwestern has given the American Bridge Company specifications for 1700 tons additional track elevation in connection with the new passenger terminal in Chicago, and the same interest will furnish 250 tons for the Walker-Burton Theater at Minneapolis. The steel for the Hartley Theater at Duluth

will be furnished by the St. Paul Foundry Company. Several contracts of considerable magnitude are pending. Bids have gone in on 550 tons of work for a new dome on the Capitol Building at Little Rock, Ark. The Boston Store in Chicago, 4000 tons, is still pending, and Mandel Brothers contemplate erecting a new building which will require about 10,000 tons. It is expected that a large office building at Portland, Ore., will be let in the near future. We quote plain material from mill, 1.78c. to 1.88c., Chicago; from store, 2c., Chicago.

Sheets.—Consumers of sheets have been placing contracts freely to cover their requirements through the first half. The local independent mill took one order a day or two ago for 1000 tons from a manufacturing consumer, and smaller orders aggregate about as large a tonnage as the mill officials care to take in pursuance of their usual cautious policy. It is known here, however, that all the sheet mills have booked their capacity pretty well through the first half. We quote mill prices as follows: No. 10 blue annealed, 1.93c.; No. 28 black, 2.58c.; No. 28 galvanized, 3.68c. Prices from store, Chicago, are: No. 10 blue annealed, 2.25c. to 2.35c.; No. 28 black, 2.90c. to 3c.; No. 28 galvanized, 4c. to 4.10c.

Plates.—The Atchison, Topeka & Santa Fé Railroad has placed with the American Car & Foundry Company an order for 10,000 cars, which will add a respectable tonnage to the business which congests the plate mills, as these cars are to be of steel construction or with steel underframes. The Hawley roads are in the market for 750 cars, and it is understood that other Western roads are figuring on large prospective requirements in the way of equipment, but find it useless to place orders at this time for steel cars, as they could not be delivered until late next spring, when they may not be needed. It will be necessary for the plate mills to enlarge their capacity before this business can be taken care of satisfactorily, as existing mills have covered their capacity pretty well through the first half of 1910. We quote mill prices at 1.78c. to 1.88c., Chicago; store prices, 2c., Chicago.

Bars.—The new business taken the past month has been surprisingly heavy, and indicates that consumers are revising their estimates of their requirements in the first half. Every branch of the bar trade feels the impulse of a heavier demand. Hard steel bars rolled from old rails continue strong and are growing in favor with consumers. For several weeks the offerings of old rails by the railroads have been heavy, and dealers expected a decline in the price, but they have all been readily taken by the mills at firm prices, showing the growth in the consumptive demand. It is understood that orders are pending from Western railroads this week for about 5000 tons of bar iron which will make a respectable addition to the bookings of the bar iron mills. We quote as follows: Soft steel bars, 1.68c. to 1.78c.; bar iron, 1.60c. to 1.65c.; hard steel bars rolled from old rails, 1.60c. to 1.65c., all Chicago.

Merchant Steel.—The demand for the various forms of merchant steel has been very heavy the past fall, especially from implement manufacturers, machinery builders and other large consuming interests. The mills have specifications covering practically their entire output through the first half, and find it difficult to take care of new buyers and the current demand from the jobbing trade. Schedule prices are maintained very closely.

Cast Iron Pipe.—The city of St. Paul, Minn., has been in the market for 2500 tons of small sizes of water pipe, which has been let to the American Cast Iron Pipe Company, Birmingham. The St. Paul Gas Company has purchased 1600 tons of gas pipe from the United States Cast Iron Pipe & Foundry Company. Other municipalities and gas interests have inquiries pending, and it is expected that business will be more active in the course of the next month in lettings for 1910 delivery. On current business we quote, per net ton Chicago, as follows: Water pipe, 4-in., \$28.50; 6 to 12 in., \$27.50; 16-in. and up, \$26.50, with \$1 extra for gas pipe.

Metals.—The Standard Oil decision has had the effect of checking the interest of consumers in the copper market. Consumptive buying had been very liberal for deliveries running through January in this market, but although copper can now be obtained for February shipment, buyers are holding off and are taking little for the present except to cover immediate requirements. Sellers are offering slight concessions on February shipment, and casting copper is a shade weaker, but under the circumstances the market is holding steady, in view of the change in the attitude of buyers. We quote as follows: Casting copper, 13½c.; lake, 14c., in carloads, for prompt shipment; small lots, ¼c. to ¾c. higher; pig tin, car lots, 32½c. to 33c.; small lots, 34c. to 35c.; lead, desilverized, 4.40c. to 4.50c., for 50-ton lots; corroding, 4.65c. to 4.75c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 6.30c. to 6.40c.; Cookson's antimony, 10½c., and other grades, 9¼c. to 10¼c.; sheet zinc is \$8, f.o.b. La Salle, in car lots of 600-lb. casks. On old metals we quote: Copper wire, crucible shapes, 14c.; copper bottoms, 11¼c.; copper clips, 13c.; red brass, 12¼c.; yellow

brass, 10c.; light brass, 7c.; lead pipe, 4½c.; zinc, 5.25c.; pewter, No. 1, 23c.; tin foil, 25c.; block tin pipe, 27c.

Old Material.—The congestion which has prevailed in the scrap market the past two months appears to be slowly clearing up and values have been steadier the past week. Rerolling rails held firm through the declining market and heavy melting steel lost only 75c. from the highest value reached in September, and now shows signs of recovering some of the ground lost. Consumers outside of the business controlled by the syndicate of steel scrap dealers have been in the market the past week and have offered as high as \$16.25, some business being done between that figure and \$16. Wrought scrap, which showed the largest shrinkage in value, is a shade stronger, and the grades which go into car wheel mixtures are expected to be in more active demand in the near future. Special lines, like car axles, locomotive tires and boiler punchings, are very strong. The following prices are per gross ton, f.o.b. Chicago:

Old iron rails.....	\$20.00 to \$20.50
Old steel rails, rerolling.....	18.00 to 18.50
Old steel rails, less than 3 ft.....	17.25 to 17.75
Rerolling rails, standard sections, sub-	
ject to inspection.....	23.50 to 24.50
Old car wheels.....	18.50 to 19.00
Heavy melting steel scrap.....	16.00 to 16.50
Frogs, switches and guards, cut apart.....	16.00 to 16.50
Shoveling steel.....	15.50 to 16.00

The following quotations are per net ton:

Iron angles and splice bars.....	\$17.50 to \$18.00
Iron car axles.....	21.50 to 22.00
Steel car axles.....	20.50 to 21.00
No. 1 railroad wrought.....	14.75 to 15.25
No. 2 railroad wrought.....	13.75 to 14.25
Springs, knuckles and couplers.....	14.75 to 15.25
Locomotive tires, smooth.....	18.25 to 18.75
No. 1 dealers' forge.....	12.50 to 13.00
Steel axle turnings.....	11.75 to 12.25
Machine shop turnings.....	10.50 to 11.00
Cast and mixed borings.....	7.00 to 7.50
No. 1 busheling.....	12.75 to 13.25
No. 2 busheling.....	9.75 to 10.25
No. 1 boilers, cut to sheets and rings.....	11.50 to 12.00
No. 1 cast scrap.....	14.75 to 15.25
Stove plate and light cast scrap.....	12.50 to 13.00
Railroad malleable.....	14.75 to 15.25
Agricultural malleable.....	13.00 to 13.50
Pipes and flues.....	11.50 to 12.00

Philadelphia.

PHILADELPHIA, PA., November 30, 1909.

Scattered buying is observed in some grades of pig iron, while others appear to be neglected. Foundry grades are dull, but a further buying movement in basic is noted. Notwithstanding the dullness of the iron market, no weakness has developed in prices in this district, although there is apparently a softening in quotations on some Southern brands. Finished materials continue quite active and deliveries are becoming an important consideration in quite a number of instances. Prices on all classes of rolled products are decidedly firm and, in instances, have an upward tendency. The situation on the whole is strong, notwithstanding the cessation of pig iron buying, in which activity is hardly expected much before the turn of the year. The steadily increasing activity on the part of industrial establishments is an encouraging feature and indicates a steady expansion in the demand. November, no doubt, has established new records for production in many products, and the amount of business already on the order books of producing concerns will keep them actively engaged well into the coming year. Coke has been rather quiet, while old materials are inclined toward weakness, particularly in the rolling mill grades.

Pig Iron.—There has been a further buying movement in basic iron for first and second quarter delivery, transactions aggregating some 25,000 tons, at \$18.75, delivered, having been announced. Inquiry for a fair sized lot, for shipment during the remainder of the present year, is before the trade, but no sale has yet been reported. The basic situation is strong; sellers have no large amount of iron to offer for early 1910 delivery, while the majority of melters also have their near future requirements pretty well taken care of. Transactions in foundry grades have not been heavy; there has been, however, a more or less constant movement in small lots, largely for early delivery, with an occasional sale of fair size for more extended shipment. Sales of this character are reported in some instances to have aggregated pretty fair amounts during the past week. No concerted buying movement is in sight, however, and the trade generally looks forward to a rather irregular demand during the coming month. Prices for standard Northern foundry grades are being well maintained; \$19.25, delivered, continues to be a fairly average price for No. 2 X foundry, for delivery up to the end of the first quarter, although \$19 and \$19.50, the inside and outside limits of the market, are still being done, dependent on tonnage, customer and delivery point. Probably the most active inquirers for foundry irons are the cast iron pipe foundries, which would take good sized lots of pipe making grades if prices were made to suit the buyers' ideas, which are usually slightly under those named by pro-

ducers. One sale of 1000 tons and another of 500 tons of pipe making iron to a Delaware River pipe maker are reported, with prospects of larger tonnages being closed in the near future. Scattered buying of Virginia foundry grades by melters in this territory continues; the quantities taken, however, are usually small, either for prompt or first quarter delivery. Prices remain firm, transactions being practically all on a basis of \$16, furnace, for No. 2 X, equivalent to from \$19 to \$19.25, delivered in this territory, although a few sellers are inclined to hold certain brands at a slight advance over those figures. One sale of 3500 tons of Virginia pipe making grades is reported for shipment to a nearby plant in that territory during the first quarter at \$15.75, furnace. While no transactions in Southern foundry iron are reported in this market, the situation shows evidences of weakness. What is understood to be resale iron has been offered, it is reported, at prices 50c. to \$1 under recent quotations for prompt iron, and if the same concessions can be had for more extended delivery, buyers in this territory might become interested, as it would bring Southern foundry nearer to a parity and in some instances below the prices at which Northern brands are held for delivery in this vicinity. Forge iron has been quiet, no transactions of importance being reported in this market; prices, however, are strong at \$17.75 to \$18.25, delivered in this vicinity. Low phosphorus iron is being more freely inquired for, although no business has been recently reported. Interest is still being shown in foreign iron, more particularly, however, on the part of merchants. Both foundry and hematite iron is being offered, but melters do not take hold very freely. No. 3 Middlesbrough can be had for spot shipment from stocks. One cargo of several thousand tons, understood to be the second consignment on a previous purchase, is in the river. Prices for domestic brands continue practically unchanged, the following range being quoted for deliveries in buyers' yards, eastern Pennsylvania and nearby points, shipment up to the end of the first quarter:

Eastern Pennsylvania, No. 2 X foundry.....	\$19.00 to \$19.50
Eastern Pennsylvania, No. 2 plain.....	18.50 to 19.00
Virginia, No. 2 X foundry.....	19.00 to 19.25
Virginia, No. 2 plain.....	18.50 to 19.00
Gray forge.....	17.75 to 18.25
Basic.....	18.75 to 19.00
Low phosphorus.....	22.75 to 23.25

Ferromanganese.—No movement in ferroalloys was reported in this territory during the week. Inquiries are very light and prices, in the absence of business, are unchanged. Quotations for delivery over the first half of next year are nominally \$44.50 to \$45.50, Baltimore.

Billets.—Quite heavy sales of forging billets, for early 1910 delivery, have been made by mills in this territory. Lots ranging up to several thousand tons, a considerable portion of which has been for Western shipment, have been sold at prices ranging from \$32 to \$34, Eastern mill, dependent on analysis. Ordinary rolling steel has also been in good demand, sales of 1000-ton lots having been made, for first quarter shipment, at \$30, mill, equivalent to \$30.60 for delivery in this territory. For prompt shipment heavy premiums are readily obtained both for forging and rolling steel.

Plates.—The demand continues heavy, mills booking a large number of orders in varying sizes for near future delivery. Consumers are, in many cases, urging shipments and makers are gradually falling behind in making deliveries. Plates for railroad work of various classes appear to be in the best demand, although boiler and structural plates are also quite active. Prices are very firm, 1.75c. to 1.80c. for ordinary plates, delivered in this territory, being the ruling quotations, although for extended forward delivery an advance of \$2 a ton is still being obtained by some makers.

Structural Material.—No particularly large orders have been reported by mills or fabricators during the week, although several interesting propositions are before the trade. The bulk of the business has been in small and moderate lots, which, in some instances, aggregate a very fair tonnage. Makers of plain shapes have order books well filled, and, with business coming out as freely as it has been, see no opportunity of catching up soon on deliveries. Prices are very firm, ranging from 1.75c. to 1.80c., delivered in this territory, dependent on specifications.

Sheets.—A further advance in the price of sheets is noted. Makers now ask and freely obtain a tenth advance on deliveries running up to the year end, while for spot shipments a premium of \$2 to \$3 a ton is obtained. Orders come out freely, and mills are fully engaged. The leading mills, however, still refuse to consider business for delivery beyond the year end. For shipment during the next 30 days the following range of prices is quoted: Nos. 18 to 20, 2.70c.; Nos. 22 to 24, 2.80c.; Nos. 25 and 26, 2.90c.; No. 27, 3c.; No. 28, 3.10c.

Bars.—The situation is practically unchanged. Steel bars, while in good demand, are not to be had, in ordinary sizes for early delivery. A fair volume of business continues to be placed for refined iron bars, although makers are not inclined to accept business for extended shipment. Prices are strong, but practically unchanged, ranging from 1.65c.

to 1.75c. for early delivery in this vicinity, dependent on specifications and tonnage.

Coke.—Little movement in either foundry or furnace coke has been reported. Sales have been confined largely to small lots for near future delivery. Prices continue to show irregularity, dependent on producers' positions. Furnace coke for early 1910 shipment ranges from \$2.75 to \$3 per net ton, at oven, while foundry coke may be had for early delivery at \$3.10, at oven, but for the first half delivery prices range from \$3.25 to \$3.50, dependent on the grade and tonnage. The following range of prices is quoted for delivery in buyers' yards in this vicinity:

Connellsville furnace coke.....	\$5.00 to \$5.25
Foundry coke.....	5.50 to 5.75
Mountain furnace coke.....	4.60 to 4.85
Foundry coke.....	4.85 to 5.25

Old Material.—The market has an easier appearance, rolling mill scrap particularly showing a recession in price. A waiting market prevails in heavy melting steel scrap, for which lower prices or a readjustment of the grading is anticipated. Large quantities of foreign steel scrap have been arriving at this port, the greater portion being for the associated steel mills, and considerable quantities are still to arrive. The associated mills maintain the \$18 delivered price for heavy steel scrap, but insist on classification being strictly up to grade; otherwise the material is rejected. Machinery cast scrap continues strong, while special rolling mill grades have been dull and are nominally quoted. For prompt delivery in buyers' yards in this vicinity the following range of prices is quoted:

No. 1 steel scrap and crops.....	\$18.00
Old steel rails, rerolling.....	\$19.00 to 19.50
Low phosphorus.....	23.00 to 23.50
Old steel axles.....	24.00 to 25.00
Old iron axles.....	30.00 to 31.00
Old iron rails.....	21.00 to 22.00
Old car wheels.....	17.50 to 18.00
Choice No. 1 R. R. wrought.....	19.50 to 20.00
Machinery cast.....	17.50 to 18.00
Railroad malleable.....	17.50 to 18.00
Wrought iron pipe.....	16.50 to 17.00
No. 1 forge fire scrap.....	16.50 to 17.00
No. 2 light iron.....	10.75 to 11.25
Wrought turnings.....	14.25 to 14.75
Stove plate.....	14.00 to 15.00
Cast borings.....	12.50 to 13.00
Grate bars.....	14.75 to 15.25

Naylor & Co., New York, pig iron, ore, steel and metal alloy merchants, have opened an office at 1032 Real Estate Trust Building, Philadelphia. Laird U. Park is in charge.

Birmingham.

BIRMINGHAM, ALA., November 29, 1909.

Pig Iron.—As far as can be ascertained, the market value of such lots as are in demand has not been lowered beyond a basis of \$14.50, Birmingham, for No. 2 foundry. The price mentioned has not been made by the furnace companies in any case, but the week's business was in the main transacted by merchant interests. The actual demand for any delivery, as indicated by the inquiries now pending and the aggregate of recent sales, is very light, and there are no indications that lower figures than are available would result in more buying. When it is taken into consideration that the movement from furnace yards continues at a rate equal to the output, with practically all surplus stock depleted, as well as the fact that leading producing interests are unwilling to carry over into the new year tonnage engaged for prior delivery by reason of the condition of order books for the first half, there is no good reason to believe that a break in the market is imminent. It is true that a significant portion of the tonnage being moved from furnace yards is being resold; in fact, to such an extent as to practically meet the demand at present; but the actual foundry melt is far in excess of anticipations some months ago, and it is known that the majority of resales have not resulted from a surplus over requirements provided for. The fact of approaching inventory time, with the natural inclination to defer additional raw material purchases until after the beginning of the new year, is given due consideration by the selling agents, and there is as yet no evidence of impatience in any quarter. It seems quite likely that the desultory demand for spot shipments will absorb the resale tonnage offered by the time that general conditions have become adjusted after the first of the year, and that the status of prices will be definitely determined by purchases of leading melters, who are understood to be interested in first half deliveries.

Cast Iron Pipe.—Latest reports relative to this market do not contain items of special interest. All local plants are understood to be well provided with orders for winter operations, but the new contracts actually in sight aggregate a comparatively small tonnage. Without a letting of such proportions as to test the strength of quotations, prices shown below are believed to correctly represent market values, and such prices are being received for the tonnage placed from time to time. It is generally understood that the cost of production has gradually increased since the in-

crease in cost of raw material, and it is quite probable that before large contracts are offered next spring higher prices will be asked. We quote water pipe as follows per net ton, f.o.b. cars here: 4 to 6 in., \$26; 8 to 12 in., \$25; over 12-in., average \$24, with \$1 per ton extra for gas pipe.

Old Material.—The consumers of this material are principally interested just at this time in bargain lots. So far no such lots are reported offered and the aggregate movement has been considerably diminished. The accumulations that are to be found on dealers' yards are generally of such grades as are in demand, but not to be had at the prices offered. We quote dealers' asking prices as follows per gross ton, f.o.b. cars here:

Old iron axles.....	\$20.00 to \$20.50
Old iron rails.....	16.00 to 16.50
Old steel axles.....	19.00 to 19.50
No. 1 railroad wrought.....	14.50 to 15.00
No. 2 railroad wrought.....	12.00 to 12.50
No. 1 country wrought.....	12.00 to 12.50
No. 2 country wrought.....	11.50 to 12.00
No. 1 machinery.....	13.00 to 13.50
No. 1 steel.....	12.50 to 13.00
Tram car wheels.....	12.50 to 13.00
Standard car wheels.....	14.50 to 15.00
Light cast and stove plate.....	11.00 to 11.50
Cast borings.....	6.50 to 7.00

Pittsburgh.

PARK BUILDING, December 1, 1909.—(By Telegraph.)

Pig Iron.—A sale of 10,000 tons of standard Bessemer iron made by J. G. Butler, Jr., of the Bessemer Pig Iron Association to the Republic Iron & Steel Company, and another sale of 10,000 tons to a western Pennsylvania steel company for delivery in first quarter of next year, at \$19, Valley furnace, are the only important transactions of the week. A local interest is in the market for 1250 tons of No. 3 foundry and 1000 tons of No. 2 for delivery in first half of next year and this business will likely be closed this week. The new demand for pig iron is quiet on all grades, but prices are strong, with the possible exception of basic and No. 2 foundry, which are slightly weaker. We quote Bessemer iron at \$19 for delivery over first half of next year; basic, \$17.25 for first quarter; malleable Bessemer, \$17.50; No. 2 foundry, \$17 to \$17.25, and gray forge, \$16.50, all at Valley furnace, with a 90-cent freight rate for delivery in the Pittsburgh District. It is probable that small lots of basic iron for prompt shipment held by brokers might be had at \$17, Valley furnace.

Steel.—From some quarters come reports that the supply of Bessemer and open hearth billets and sheet and tin bars is a little better. The Bessemer department of the Homestead Steel Works of the Carnegie Steel Company is now in full operation, for the first time in nearly two years, the steel rolled going into plates and structural material. Bessemer billets for prompt delivery are held at about \$27.50 to \$28, and 4 x 4 in. open hearth billets at about \$28.50 to \$29. Sheet and tin bars for December delivery are held at \$29 to \$29.50, while \$30 seems to be the accepted price for first quarter delivery. Forging billets are scarce and very firm at \$31 to \$32, Pittsburgh.

(By Mail.)

A lull continues to some extent in the new demand for pig iron, steel and finished material, as well as for scrap and coke, but a letting up in new business is always expected at the close of the year, and the present quietness is not causing any anxiety. In fact, it is rather pleasing to the mills, as it gives them a breathing spell and will allow them to catch up to some extent on back deliveries of material on which they are at present behind two or three months or longer. As the close of the year draws near, consumers are getting ready to take inventory and will not take in any new material or place new orders, unless absolutely necessary. Offers are out on a pretty heavy tonnage of scrap, but deliveries are specified not to commence until next year, and dealers as a rule are turning such inquiries down, not caring to take chances on a rise in the market. The principal item of the week was a sale of 10,000 tons of Bessemer iron, made by J. G. Butler, Jr., of the Bessemer Pig Iron Association, at \$19, Valley furnace, to the Republic Iron & Steel Company for first quarter delivery. The Republic Company has been a steady buyer of Bessemer iron in the last three or four months, having taken 60,000 to 70,000 tons. It has blown in its Hannah furnace at Struthers, Ohio, and all of its six stacks in the two valleys are now in operation. The good weather has allowed this company to make rapid progress in the building of its new

tube mills near Haselton, and it will be a seller of tubing about March. This will make further demands on its output of Bessemer steel, and so far the company has not made any engagements on sheet and tin bars for next year delivery. The Basic Steel Company, an identified interest of the De Forest Sheet & Tin Plate Company, will soon start work on the building of an open hearth basic steel plant at Niles, Ohio, which will have a daily capacity of about 500 tons. It will supply the De Forest Company with sheet and tin bars, and will also sell bars in the open market. The Jones & Laughlin Steel Company will blow in next week one of its new blast furnaces at Aliquippa, and the event will be celebrated with considerable ceremony. Leading iron and steel makers from all over the country and other special guests will be present. Prices on finished material are unchanged, but continue very firm. Specifications are pouring into the mills at an unusual rate for this season of the year and shipments are enormously heavy. Coke and scrap are quiet and a little softer in price.

Ferromanganese.—No large sales have been made in this market recently, but there are some inquiries for ferro for first half of the year delivery. We quote 80 per cent. foreign at \$45 to \$45.50, seaboard, for first half of the year, and \$46 to \$47, seaboard, for second half. A sale of 50 tons for December and January is reported at \$45, seaboard.

Ferrosilicon.—There is not much new inquiry and the market has been quiet for the past week or more. Prices are firm. We quote 10 per cent. at \$23.90; 11 per cent., \$24.90; 12 per cent., \$25.90, and 50 per cent., \$63.50 to \$64, Pittsburgh, for reasonably prompt shipment.

Muck Bar.—No change in the price of muck bar has been made for several weeks, but the market is firm. We note a sale of 1000 tons of high grade bar in random lengths, made from strictly all pig iron, at \$30, and 500 tons of light bars, cut to lengths, at \$30.50, Pittsburgh. We quote best grades of muck bar in random lengths, made from all pig iron, at \$30, Pittsburgh.

Wire Rods.—Some new inquiry has appeared for wire rods for first half of the year delivery, but a number of the larger consumers are covered into first quarter or longer. The supply of rods available for the market is very limited and prices are firm. We quote Bessemer, chain and open hearth rods at \$33 to \$34, Pittsburgh.

Skelp.—The demand for sheared sizes of iron and steel skelp continues active and the mills are filled up for several months and are behind in deliveries. We quote: Grooved steel skelp, 1.55c.; wide skelp in sheared sizes, 1.60c.; grooved iron skelp, 1.75c. to 1.85c., and sheared sizes of wide iron skelp at 1.90c. to 1.95c., f.o.b., at mill, Pittsburgh.

Steel Rails.—The largest contract for standard sections taken recently by the Carnegie Steel Company was one from the Toledo & Ohio Central Railroad for 3000 tons, and the company has booked a number of smaller orders ranging from 500 to 1000 tons. It received new orders in the past week for 2747 tons of light rails. We quote steel axles at 1.75c. to 1.80c., and splice bars, 1.50c., at mill, Pittsburgh. Light rail prices are as follows: 8 to 10 lb., \$32; 12 to 14 lb., \$29; 16, 20 and 25 lb., \$28; 30 and 35 lb., \$27.75, and 40 and 45 lb., \$27, Pittsburgh. These prices are for 250-ton lots and over, and for small lots premiums of 50c. per ton and more are being paid. We quote standard sections at \$28, at mill.

Plates.—New demand and specifications for sheared plates are heavier at the present time than ever before in the history of the trade, and all the plate mills are very much in arrears in deliveries. The two leading mills will not take on any new customers, and in some cases are cutting down tonnages wanted by old ones. The Pressed Steel Car Company is said to have orders on its books for 30,000 to 40,000 steel cars, and the Standard Steel Car Company is reported to have orders for about 20,000. These two concerns are specifying for about 1800 tons per day of plates and small shapes, and the requirements of the Pressed Steel Car Company will soon be heavier, as it expects to have its Woods Run Works in full operation by the first of the year. We quote 1/4-in. and heavier plates at 1.55c., at mill, in large lots for prompt shipment, and 1.60c. to 1.65c. in small lots.

Structural Material.—Actual bookings of the American Bridge Company in November amounted to about 64,000 tons, a considerable increase over October. It has work ahead for the next six months or longer. The Pittsburgh & Shawmut Railroad is in the market for 6000 tons of bridge work, and bids will go in this week. The McClintic-Marshall Construction Company has taken 700 tons for an addition to the plant of the National Malleable Castings Company at Chicago. The Huntington & Northern Railroad is in the market for a bridge across the Ohio River at Huntington, W. Va., and bids have gone in on 500 tons of material for another building for the University of Pittsburgh. Deliveries by the mills are not much better and they are from two to three months behind in shipments. Prices are firm. We quote beams and channels up to 15 in. at 1.55c., at mill, for prompt shipment, while small lots bring 1.60c. to 1.65c., at mill.

Sheets.—In all probability the strike in the sheet mills of the American Sheet & Tin Plate Company will soon be over. The only idle plant of the concern is the Aetna-Standard Works at Bridgeport, Ohio, containing 23 hot mills, but in the last week about 200 of the men have applied to the company for their old positions, and it is probable that this large sheet plant will be started about the first of the year. New demand and specifications against contracts for black and galvanized sheets, and also for roofing material, are heavier now than ever known at this season of the year, and all the sheet mills are very much behind in shipments. A heavy tonnage has been entered by the leading sheet mills for first quarter and first half of next year, and the sheet trade promises to be very active for some months to come. The Youngstown Sheet & Tube Company expects to start its eight new sheet mills about January 1. The advances in prices on sheets made on November 11 are being firmly held. We quote: Blue annealed sheets, Nos. 3 to 8, 1.70c.; Nos. 9 and 10, 1.75c.; Nos. 11 and 12, 1.80c.; Nos. 13 and 14, 1.85c., and Nos. 14 and 15, 1.95c. One-pass box annealed No. 28 black sheets, 2.40c., and No. 28 galvanized, 3.50c., at mill. We quote corrugated roofing sheets at \$1.70 per square for painted and \$3 for galvanized, 2½-in. corrugations. Jobbers charge the usual advances over these prices for small lots from store.

Tin Plate.—When the strike in the tin plate mills of the American Sheet & Tin Plate Company started on July 1 the company closed down at once its Laughlin Works at Martin's Ferry and its La Belle tin mill at Wheeling, and these two plants have been idle ever since, the company having made no effort to start them. Recently the men employed in the Laughlin Works held a meeting, called off the strike and have sent petitions to the company for their old positions. It is not unlikely, therefore, that the Laughlin tin mill will be started as soon as it can be made ready. All the leading tin plate mills have an enormous amount of tonnage on their books, are shipping out their product as fast as made and are still very much back in deliveries. It is stated that in some cases premiums of 10c. a box over regular prices are being paid for small lots of tin plate where the mill promises to make spot shipment. We quote 100-lb. cokes at \$3.60 per base box, f.o.b. Pittsburgh, for delivery through first half of next year.

Bars.—The new demand for both iron and steel bars is not quite so active as it was, all the leading consumers being pretty well covered for some time ahead, but specifications are pouring into the mills at an unprecedented rate. Mills are steadily refusing to take on new customers, and in many cases are cutting down tonnages wanted by their regular trade. Consumers are urgent in their demands for deliveries, but, with their congested condition, the mills cannot begin to make deliveries as fast as wanted. The leading steel bar mills are practically filled up on all they can make into first quarter of next year and have a good deal on their books for second quarter. The bar iron mills are also very much back in deliveries. The Republic Company, the leading maker of iron bars, is turning out more than ever before in its history. Prices are firm and we quote steel bars at 1.50c. to 1.55c., for delivery within three to four weeks. Several of the leading makers are booking contracts from regular customers for first quarter delivery at about 1.45c., at mill. We quote iron bars at 1.70c. to 1.75c., Pittsburgh, for prompt shipment.

Hoops and Bands.—Specifications against contracts are coming in very freely, but the new demand is not as urgent as it was some time ago. Consumers are trying to cover for first half of next year at present prices, but some makers are refusing to take business so far ahead, except at an advance over regular prices. We quote steel hoops for forward delivery at 1.50c. to 1.55c. and for prompt shipment at 1.60c. to 1.65c., at mill. Steel bands are firm, at 1.45c. to 1.50c., on contracts for forward delivery, and 1.55c. to 1.60c. for reasonably prompt shipment.

Spelter.—Prices on prime grades of Western spelter seem to be pegged at 6.25c., East St. Louis, a local consumer having bought yesterday 50 tons at this price, equal to 6.37½c., Pittsburgh. The new demand for spelter is active, and the price is very firm. Consumption is heavier than at any time in the past year or more.

Spikes.—Several heavy inquiries from railroads for spikes for delivery next year are in the market. All the spike makers have a large amount of orders on their books and are filled up for some time ahead. Prices are very firm and several makers refuse to sell through first half of next year, except at a slight advance. We quote standard sizes of railroad spikes, 4½ x 9-16 in. and larger, at \$1.75 for prompt shipment and \$1.80 for first quarter. Boat spikes are firm at \$1.80, base, and small railroad spikes at \$1.80, base. These prices are for carload and larger lots, 10c. per keg advance being charged for small lots.

Shafting.—This material continues active in new demand, while specifications against contracts placed prior to the recent advance of two points in price are coming in freely. We are advised that present discounts on shafting

are being absolutely maintained, and that the market is in very satisfactory condition. We quote shafting at 55 per cent. off for carload and larger lots, and 50 per cent. off in less than carloads delivered in base territory.

Rivets.—While the new demand is fairly active it is not quite as urgent as it was some time ago. All the rivet makers are pretty well filled up with orders for the next several months and prices are firm. We quote: Structural rivets, ¾ in. and larger, 2.05c., base; cone head boiler rivets, ¾ in. and larger, 2.15c., base; ¾ in. and 11-16 in. take an advance of 15c., and ¾ in. and 9-16 in. take an advance of 50c.; in lengths shorter than 1 in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

Merchant Pipe.—The recently organized Arkansas Natural Gas Company, controlled largely by local interests, has a tentative inquiry out for about 200 miles of 7 to 12 in. pipe, and this business is expected to be placed shortly. The general demand for pipe continues heavier than usual at this season, and all the mills are well filled up and operating to full capacity. New business entered by the leading pipe mills in November compared very favorably with October. One or two makers of steel pipe are not disposed to take orders for any more material than absolutely necessary to supply their regular customers, believing that within a short time there may be an advance of one or two points in prices. The A. M. Byers Company, Inc., is now understood to be quoting 73 and 5 on 2 to 6 in. iron pipe to its largest trade. The schedule of discounts will be found under "Prices f.o.b. Pittsburgh."

Boiler Tubes.—As noted last week, large inquiries are in the market for boiler tubes from several of the leading roads, and it is expected that some good orders will be placed before the first of the year. The demand for merchant tubes is more active than it has been in some time, and it is stated that regular discounts on both iron and steel tubes, printed elsewhere in this issue, are being absolutely held.

Iron and Steel Scrap.—We are getting closer to the end of the year, and, as is always the case, consumers are not willing to make contracts for scrap for December delivery if they can possibly get along without it. For this reason, and also because most of the larger consumers are pretty well covered, the amount of scrap being sold by dealers to consumers is lighter at present than for some time, and the tone of the market is softer. Heavy steel scrap is still quoted at \$17.50 to \$17.75 at such consuming points as Monessen, Brackenridge, Follansbee, Sharon and Steubenville. The embargo on scrap destined for the Allegheny Steel Company at Brackenridge, Pa., has not yet been lifted, and this has caused a decided drop in prices of borings and turnings, that company being the leading consumer of these materials in this market. We quote heavy steel scrap for delivery at above named points at \$17.50 to \$17.75, but some dealers are refusing to go below \$18, and say they are able to make small sales at this price. No. 1 cast scrap is weak and we quote it at \$16.50 to \$16.75 and No. 2 at \$15.50 to \$15.75. On other grades of scrap dealers quote about as follows: Low phosphorus melting stock, \$21 to \$21.25; bundled sheet scrap, \$16.25 to \$16.50; rerolling rails, \$18.50 to \$18.75, for delivery at Cumberland, Md., Cambridge or Newark, Ohio; railroad malleable, \$16 to \$16.25; No. 1 busheling, \$16 to \$16.25; No. 2, \$13 to \$13.25; grate bars, \$14 to \$14.25; locomotive axles, \$28 to \$28.25; iron axles, \$27.25 to \$27.50; steel axles, \$21.50 to \$21.75; No. 1 railroad wrought scrap, \$19 to \$19.50; old car wheels, \$18 to \$18.25; cast iron borings, \$11; machine shop turnings, \$13. Sheet bar crop ends are weaker in price, and we quote these at \$19. All the above prices are per gross ton, f.o.b. Pittsburgh. We note sales of some 1200 tons of No. 1 cast scrap at about \$16.50, Pittsburgh, and about 1000 tons of borings, sold for delivery East, at a price netting the seller slightly under \$11, Pittsburgh.

Coke.—An Eastern blast furnace interest, whose coke contract expires December 31, is in the market for 2500 tons a day, and several of the leading coke companies are figuring on this inquiry. Most consumers of blast furnace and foundry coke are pretty well covered for the first half of next year, but the actual inquiry for coke is quieter than it has been for some time. We continue to quote standard makes of furnace coke for first half delivery at \$2.85 to \$2.90 per net ton, at oven, and best grades of 72-hour foundry coke at \$3.25 to \$3.50 per net ton, at oven, for first half. Standard makes of furnace coke for prompt shipment can be had at \$2.70 to \$2.75 per net ton, at oven. In cases where coke is loaded on cars and has to be moved, it might be had at a lower price for spot shipment.

Frank W. Highberger, for some years in the billet and rail sales department of the Carnegie Steel Company, but for the past year with F. N. Armour, sales agent for the Mount Pleasant Coke Company, has embarked in business on his own account under the name of F. W. Highberger & Co., 504 Frick Building, Pittsburgh, and will do a general business in coal and coke.

Cleveland.

CLEVELAND, OHIO, November 30, 1909.

Iron Ore.—Aided by fairly good weather conditions, the ore companies are rapidly cleaning up their shipments and few cargoes will be sent from the upper lake ports after December 5, when the regular insurance expires. Some of the shippers are now through at Duluth and Marquette, but a few late cargoes will be sent from Ashland and Escanaba. The last boats of the Pittsburgh Steamship Company to go after ore cargoes started up the lakes November 27. During the past week there have been a number of inquiries for this season's non-Bessemer ore for puddle-fix purposes from iron mills. These inquiries are mostly for small lots and a large share of them come from the East. Because they have waited until so late in the season, the buyers are having some trouble in finding the ore they want. Although no steps have been taken toward fixing prices for the coming season, there is considerable quiet talk going on regarding the matter. While merchant firms seem to agree pretty generally to an advance of 50c. on Bessemer ore, some objection is being made to an advance of over 25c. on non-Bessemer grades. Prices at Lake Erie docks per gross ton continue as follows: Old Range Bessemer, \$4.50; Mesaba Bessemer, \$4.25; Old Range non-Bessemer, \$3.75; Mesaba non-Bessemer, \$3.50.

Pig Iron.—The demand shows a slight improvement as compared with the previous few weeks, but the market is still quiet and not much buying is expected before the first of the year. In foundry grades sales during the week have been limited mostly to lots of 100 tons and under for prompt shipment to consumers whose requirements for the balance of the year proved to be slightly larger than they expected. A few sales of off foundry iron are also reported. While furnacemen are getting but little new tonnage on their books consumers as a rule are taking their iron on contracts as fast as they can get it and producers regard the situation as very satisfactory. Although there have been no inquiries large enough during the past three or four weeks to thoroughly test the market, local producers and Valley furnaces are generally holding for the same prices that they were a month ago, those that are asking 50 cents or more above the market showing no disposition to shade their quotations. Local furnaces quote No. 2 foundry at \$18, at furnace, for December and first half shipment. In the Valley No. 2 is quoted at \$17.25 for spot shipment and first quarter, and \$17.25 to \$17.50 for the first half. We note the sale of a round lot of off basic iron. Local furnaces are receiving a few inquiries from Canadian consumers for basic and malleable iron. For December delivery we quote, delivered, Cleveland, as follows:

Bessemer	\$19.90
Northern foundry, No. 1	\$18.65 to 18.75
Northern foundry, No. 2	18.15 to 18.25
Northern foundry, No. 3	17.65 to 17.75
Southern foundry, No. 2	18.85
Gray forge	17.40 to 17.65
Jackson County silvery, 8 per cent. silicon	20.55

Coke.—There is a fair demand for foundry coke in small lots from consumers who find that they need more than they contracted for during the last few weeks of the year. There are also some good inquiries for foundry coke for the first half. Spot furnace coke in small lots is slightly weaker, but the market is firm on contracts for first half delivery. We quote standard Connellsville furnace coke at \$2.65 to \$2.75 per net ton, at oven, for spot shipment, and \$2.85 to \$3 for the first half. Connellsville 72-hour foundry coke is held at \$3.25 for spot shipment and \$3.25 to \$3.50 for the first half.

Finished Iron and Steel.—The leading interest reports the volume of specifications as heavy as ever, but with the local agencies of most of the independent mills less tonnage is being ordered on contracts than a few weeks ago. The falling off has been insufficient, however, to result in any improvement in deliveries. Because of the congested condition of the mills, some consumers in anticipation of their requirements specified heavily a few weeks ago and are now ordering less than they otherwise would. Mills are still being crowded for shipments on material actually needed. Large specifications are coming in on steel bar contracts for the first quarter delivery, and shipments on these specifications are not being promised until well along in February or later. Steel bars for early shipment are hard to get, and buyers are paying \$2 and more a ton premium for early delivery. For future delivery steel bars are quoted at 1.45c. to 1.50c., Pittsburgh. The demand for plates continues heavy and local mills are crowded with orders. The demand for structural material for early delivery continues fairly good, and Eastern mills continue to pick up numerous small lot orders in plates and shapes for prompt shipment at 1.60c., at mill. For forward delivery we quote plates and structural material at 1.60c., Pittsburgh, and some contracts for delivery during the first half are being placed at that price. Very few of the mills, however, are willing to make contracts at the present time. The demand for iron bars, while fairly good, is not sufficient to keep all the mills running at full capacity, and price quotations are not being firmly main-

tained. Buyers are insisting on making contracts through the first half, but the mills as a rule are not disposed to sell beyond the first quarter. We quote iron bars at 1.60c. to 1.65c., Cleveland. While no structural work requiring large tonnages is coming out at present, there is a fair volume of inquiries from bridge companies that want to cover for work that they have in prospect, mostly small railroad bridge work. The demand for sheets continues very active and prices are firm. Some contracts for the first quarter are being placed at current prices. Warehouse business with jobbers continues heavy, and November sales will aggregate about the same as in October.

Old Material.—The market continues dull and prices generally are weak. With two or three exceptions, however, nominal quotations are unchanged. Consumers still have plenty of scrap on hand and are not anxious to buy, although it is believed that considerable tonnage could be sold if it was offered cheap. Yard dealers have their yards well filled and are buying little. They are holding their stocks for better prices. The Pennsylvania Lines West and the Erie Railroad have lists out, on which they will close December 2. Prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	\$16.50 to \$17.00
Old iron rails	20.00 to 20.50
Steel car axles	20.50 to 21.00
Old car wheels	17.50 to 18.00
Heavy melting steel	16.00 to 16.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	14.50 to 15.00
Railroad malleable	17.00 to 17.50
Light bundled sheet scrap	11.00 to 11.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	\$21.00 to \$21.50
Cast borings	9.00 to 9.25
Iron and steel turnings and drillings	10.75 to 11.00
Steel axle turnings	12.00 to 12.50
No. 1 busheling	14.50 to 15.00
No. 1 railroad wrought	17.00 to 17.50
No. 1 cast	14.75 to 15.25
Stove plate	12.50 to 13.00
Bundled tin scrap	11.00 to 11.50

Buffalo.

BUFFALO, N. Y., November 30, 1909.

Pig Iron.—Although market conditions may be characterized as quiet, there is an undertone of increasing strength. Sales for the week have been good, totaling 10,000 to 12,000 tons, mostly foundry grades, some of the orders being for shipment outside of the territory naturally tributary to this district. A considerable tonnage of orders offered has also been declined by the furnaces, owing to unacceptable price or delivery requirements. All of the Buffalo District furnaces are now pretty well sold up for the entire first half of 1910 and probably no urgent effort will be made by the furnacemen to sell their products for the next seven months. The situation is a good deal stronger from the producers' viewpoint than a good many consumers appear to realize. If the consumers' needs for the period mentioned are reasonably well covered the status of the market will run smoothly on an even keel; but if not, and the demand is enlarged, prices are bound to go up, as the cost of production is rising. The increased cost of coke and the expected advance in ore are raising the producing cost of pig iron by nearly \$2 per ton. There has been no change in price schedules during the week and, although very firmly held, furnacemen in most instances maintain a disposition to be reasonable and conservative in quotations made. We quote as follows for remainder of year and first quarter deliveries, f.o.b. Buffalo:

No. 1 X foundry	\$17.25 to \$17.75
No. 2 X foundry	17.00 to 17.50
No. 2 plain	16.75 to 17.25
No. 3 foundry	16.50 to 16.75
Gray forge	16.25 to 16.50
Malleable	17.50 to 18.00
Bessemer	19.25 to 19.75
Basic	18.25 to 18.75
Charcoal	20.25 to 21.00

Finished Iron and Steel.—The demand is strongly maintained in all lines of finished products. It is understood that one of the large interests is practically out of the market on bar material, being unable to make deliveries before April 1 and declining to quote at the present time for deliveries beyond that date. Other independent interests are also turning down bar material orders even at advanced prices owing to inability to furnish by the time required. There has been additional closing of contracts in cold rolled and cold drawn steel and several interests are running almost as greatly behind in their deliveries on this material as are the mills on hot rolled material, in some instances being four to five months behind on shipments. The Lackawanna Steel Company this week started double turn on its plate mill. The demand for structural material keeps up in good volume and a fair number of contracts are being closed. The Syracuse Bridge Company this week received the contract for the steel required for the C. M. Warner Building, Syracuse, a little less than 700 tons. The contract for the

2000 tons of steel sheet piling required in the construction of the intake tunnel of the Ontario Power Company at Niagara Falls, Ont., has, it is understood, been placed, one-half each with the Lackawanna Steel Company and the Jones & Laughlin Steel Company. Bids were opened the middle of this week for steel required for the Gleason Works factory extension at Rochester, about 300 tons. Bids will be received the coming week for structural steel and expanded metal required for the new machine shop of the Buffalo Foundry & Machine Company, 300 tons, and for the Buffalo Glass Company's warehouse, 150 tons. Wurtz & Sons Structural Iron Works received the contract for fabricating and erecting steel for the Buffalo Co-operative Stove Works addition. Buffalo's new bridge and structural steel works, the Lackawanna Bridge Company's plant, which is to commence operations December 15, will have as its initial order a contract just received for a portion of the new Brooklyn subway work.

Old Material.—General conditions are somewhat better than reported last week. The congestion at that time prevailing has been in a measure relieved and a fair amount of business is being transacted. No large trading is now expected, however, until after the first of the year. Prices are firmly maintained, there being no quotable change since last report. Dealers' prices per gross ton f.o.b. Buffalo are as follows:

Heavy melting steel.....	\$16.50 to \$17.00
Low phosphorus steel.....	21.00 to 22.00
No. 1 railroad wrought.....	18.00 to 18.50
No. 1 railroad and machinery cast scrap.....	17.00 to 17.50
Old steel axles.....	20.50 to 21.00
Old iron axles.....	26.00 to 26.50
Old car wheels.....	17.50 to 18.00
Railroad malleable.....	17.00 to 17.50
Boiler plate.....	14.50 to 15.00
Locomotive grate bars.....	13.00 to 13.50
Pipe.....	14.00 to 14.50
Wrought iron and soft steel turnings.....	11.50 to 12.00
Clean cast iron borings.....	9.50 to 10.00
No. 1 bushing scrap.....	14.00 to 14.50

San Francisco.

SAN FRANCISCO, CAL., November 24, 1909.

The buying movement on the Pacific Coast has not been maintained at the high volume of October, and nearly all departments show a slight falling off in business. The lighter bookings are, no doubt, due partly to the refusal of the mills to accept orders for extended delivery on some lines, together with a desire on the part of buyers to keep down their holdings from now till the first of the year. In some departments also heavy orders were placed last month, and the supplies arriving now will relieve the situation somewhat for the next month. Unfabricated structural material is an exception, the volume being at least equal to that of last month, and probably larger, owing to the increase in fabricating contracts all along the coast. In most lines of finished materials local stocks are badly broken, and jobbers frequently have great difficulty in filling orders. Sheets are especially scarce, some of the stock sizes being practically out of the market, while deliveries are extremely slow. Some advance in local jobbing prices is expected shortly, and there is considerable inquiry from consumers. In other lines the immediate consuming demand has moderated slightly, and local mill representatives anticipate a moderate volume of business for the next month. All interests are preparing for an exceedingly active year in 1910, however, and the outlook is for a sharp increase in January.

Rails.—Orders show some decrease, both for light and standard sections. Work in the mining and logging districts will be somewhat interrupted during the winter, heavy rains having already put a stop to development in some quarters. With a prospect of immediate resumption in the spring, however, local merchants are preparing to increase their supplies of light rails. No large orders for standard rails are coming out at present, and while several more or less tentative propositions are coming up, the orders are not likely to be placed until late in the winter. Deliveries are increasingly slow. Plans have been completed for financing a road connecting the Northwestern Pacific with the coast at Fort Bragg, work to be started in the spring. A new lumber road is also planned for Eureka, Cal. The steamer Alden has been chartered for a cargo of rails from the Dominion Steel Company's mill to Vancouver, B. C.

Bars.—Supplies on hand are running short, some sizes being difficult to find in the local warehouses. Arrivals are fairly large, but not in excess of current requirements, while deliveries can now be had almost as quickly from foreign ports as from the East. The consuming demand is less insistent than before, but is quite large as compared with the earlier part of this year. Merchants are holding back their orders until after the first of the year, though from all reports considerable business is being placed with the importing interests. Prospective requirements are steadily increasing and it is freely predicted that the movement next year will be heavier than ever before. Numerous projects are coming up which will require large quantities of reinforcing material, notably the local harbor improvements and

the reservoirs and cisterns for the San Francisco water system. Jobbing prices are firmly held as before, quotations from store being: Steel, 2.40c.; iron, 2.20c. Importers are offering to land foreign bars in San Francisco at 1.80c., c.i.f.

Structural Material.—The outlook is extremely satisfactory to the local fabricating interests, which are taking on larger quantities of work than for many months. The present situation in San Francisco indicates a heavy increase of small work, in which the Eastern fabricators have taken little interest of late, and the volume of business to be let during the first half of 1910 is expected to compare favorably with the records of 1907. The effect of the order to remove wooden structures within the fire limits before next May is already apparent, as many of these structures are being torn down, and there is a much heavier demand for business quarters in permanent buildings. Plans have been made covering nearly all the lots now vacant on the principal streets, and while money for building is not plentiful, it is believed that means will be found to complete the work in the near future. Most of the local contracts recently let or in prospect are unimportant, but will aggregate a heavy tonnage. Among those to be placed shortly are about 800 tons for the new jail, 680 tons for a municipal pumping station at Second and Brannan streets, and a moderate tonnage for the Denman School. A contract for about 300 tons for the Columbia Steel Company's new plant at Black Diamond, Cal., has been taken by the McClintic-Marshall Construction Company. The Yeon Building, a 15-story structure in Portland, Ore., is to be let shortly. A rumor is being circulated that work is to be started on a new city hall for San Francisco shortly after the first of the year, to be completed in a year and a half. A large contract has been let for the construction of pier 54. A fabricating order has just been placed for a five-story building for the First National Bank, at Riverside, Cal., with a Los Angeles contractor. Plans are being prepared for another double track bridge for the Oregon Railway & Navigation Company at Portland, Ore. Robert W. Hunt & Co. have been employed by the Harbor Commissioners to inspect the material used for pier 34. Supplies of plain material in the shops of local fabricators are very light, and liberal orders are being placed with the rolling interests. A heavy movement of foreign shapes to this market is expected next year, but so far orders placed with importers have been very moderate. Beams and channels, 3 to 15 in., from store in San Francisco, are quoted as before, at 2.65c.

Pig Iron.—Foundry requirements are rather light at the moment, as there has been a slight falling off in the demand for cast iron work for the past month. Melters have accordingly kept out of the market for spot supplies, and there has so far been little demand for extended delivery. Importers are holding steadily to the former range of values and a better movement is expected after the first of the year. The outlook indicates some increase in structural cast iron work, as much of the building in prospect is of a nature to require a considerable tonnage of this material. The apparent weakness of spot pig iron in the South has not affected the value here, the quotation being nominally \$25. Chinese iron is quoted at \$25; English and Continental at \$23 to \$24.50.

Cast Iron Pipe.—While no large orders have been taken for some time, bookings on the Pacific Coast for the past month have been satisfactory, as small orders have been coming in at a good rate. More municipal projects of moderate importance are being figured than for some time, and some increase in tonnage is expected for the first quarter of next year, though this business is developing slowly. There has in the past been a strong tendency among coast municipalities to figure on steel pipe for water works, but wherever the money is available cast iron is now generally specified. The consolidation of several outlying towns with the city of Oakland is expected to bring about some improvements in both gas and water systems in that territory. Plans are being made for the installation of a gas system in the town of Mayfield, Cal. Prices in this market show no quotable change, standing at \$39 per net ton for 4-in., \$38 for 6 to 12 in., with \$1 per ton extra for gas pipe.

Merchant Pipe.—The jobbing demand continues fairly active, but orders placed by local merchants show some reduction, and the situation is expected to remain quiet for the remainder of the year. Merchants are now receiving the supplies ordered last month, which will relieve the immediate scarcity, and as the deliveries will probably extend through February it may be late in the first quarter until ordering for shipment from mills resumes its former activity. A heavy demand is expected with the close of the rainy season. With the first heavy rain ordering for the oil districts has been interrupted, as it will be difficult to make deliveries in that territory through the winter. There has been a material increase in the amount of drilling, however, and large orders are in prospect for next spring. The price of oil has advanced beyond expectations, causing a marked increase of development work. Local jobbing prices are firmly held, no change being noted since last report.

Old Material.—There has been little interest in old material since the heavy movement early in the fall. While inquiries have been of small proportions, offerings are not excessive in any line, and all supplies are steadily held up to the prices formerly quoted. Local dealers quote as follows: Cast scrap, heavy, \$18; light, \$17, per gross ton; steel scrap, \$6 to \$7, per gross ton; railroad wrought scrap, f.o.b. San Francisco, \$10.50 to \$11, per net ton; old steel rails, \$9.50, per net ton.

The final formalities of the transfer of the Hunter's Point drydock from the San Francisco Drydock Company to the Bethlehem Steel Corporation were carried out last week. The drydock has been rushed with business for the last half year.

The Western Steel Corporation, Irondale, Wash., has chartered the steamer Hyack for one year.

The Pacific Hardware & Steel Company is looking for new quarters for its establishment at Portland, Ore.

W. L. Albright, an iron manufacturer of Cincinnati, was in San Francisco last week.

R. W. Martindale, Pacific Coast representative of the United States Cast Iron Pipe & Foundry Company, is now in the East.

Commissioner Kerrigan of the California Metal Trades Association has forwarded a letter to R. H. Countiss, agent of the Transcontinental Freight Bureau at Chicago, asking reconsideration of the question of a differential of rates on fabricated and unfabricated material from the Missouri River and defined territories east thereof to the Pacific Coast.

St. Louis.

ST. LOUIS, MO., November 29, 1909.

The normal conditions of a week in which a national holiday occurs prevailed. In some lines, notably pig iron and iron and steel scrap, it is a waiting market and otherwise without features of interest. General business is remarkably active. The exceptionally fine weather prevailing in this section admits of prolonging the building season beyond the usual limits. The assets of the local banks are heavy, totaling nearly \$400,000,000, showing a net increase of over \$3,000,000 since the previous report. All the leading railroad lines of the West and South continue to report large gains in earnings.

Coke.—As generally expected by the trade, the past week proved to be a quiet one. None of the brokers was in receipt of large inquiries, and sales were confined to small lots. The feeling, however, is firm and prices rule strong in conformity with advices from the producing districts. Car shortage continues to be complained of. We quote the market unchanged at \$3.25 for prompt and \$3.50 for first half of 1910 for standard Connellville 72-hour foundry coke, per net ton, f.o.b. oven. High sulphur coke is offered at a shade less.

Pig Iron.—The market for pig iron is featureless and but little interest on the part of buyers is in evidence, barring the class who usually buy in small lots, mostly for quick shipment. Specifications on contract iron are coming in fairly well. While there are no indications of any disposition on the part of furnacemen to entertain offers on contract under the current market price, it is reported that in addition to offerings of merchant iron at \$14.50, Birmingham, some Southern producers are also willing to sell at this figure for prompt shipment. We hear that a large local company is in the market for a round lot of Nos. 1 and 2 Southern foundry for shipment over the next five months at a concession from the current prices for both kinds of iron. For future shipment the tone of the market continues strong, especially as the shading of price is confined wholly to spot iron in limited quantities, particularly in case of such furnaces as are willing to make concessions. We quote prices for Southern No. 2 foundry as follows: For prompt shipment, \$14.50; for shipment over the first half of 1910, \$15, f.o.b. Birmingham.

Finished Iron and Steel.—The demand from St. Louis territory for all classes of finished iron and steel is brisk, especially for structural steel, and specifications are coming in freely. The demand from railroads is heavy for all kinds of track material except rails, which are only wanted in comparatively small lots. There is also a good seasonable inquiry from the wholesale houses for bar iron and steel.

Lead, Spelter, Etc.—A quiet demand is reported for both lead and spelter, with prices unchanged, but firm. We quote lead at 4.25c. and spelter at 6.25c. to 6.27½c., East St. Louis. Zinc ore is steady, at \$50 per ton, Joplin base.

Old Material.—A dull market has prevailed and conditions remain unchanged. Leading dealers do not count on much improvement until after the turn of the year, since the holiday season and stock taking will militate against activity. During the fall the railroads turned loose all their accumulations and the market requires time to absorb them. Relaying rails continue scarce and are urgently wanted. While in the case of one or two items in the steel list prices

are lower, the general market remains unchanged, though in the absence of a steady demand from consumers prices are nominal for the most part. The only railroad list reported is 300 tons by the Vandalia Line. We quote dealers' prices as follows per gross ton, f.o.b. St. Louis:

Old iron rails.....	\$17.50 to \$18.00
Old steel rails, rerolling.....	16.00 to 16.50
Old steel rails, less than 3 ft.....	15.00 to 15.50
Relaying rails, standard sections, subject to inspection.....	25.00 to 25.50
Old car wheels.....	18.50 to 19.00
Heavy melting steel scrap.....	15.00 to 15.50
Frogs, switches and guards, cut apart..	15.00 to 15.50

The following quotations are per net ton:

Iron fish plates.....	\$15.00 to \$15.50
Iron car axles.....	21.00 to 21.50
Steel car axles.....	20.00 to 20.50
No. 1 railroad wrought.....	15.00 to 15.50
No. 2 railroad wrought.....	14.00 to 14.50
Railway springs.....	14.00 to 14.50
Locomotive tires, smooth.....	16.50 to 17.50
No. 1 Dealers' forge.....	11.50 to 12.00
Mixed borings.....	7.50 to 8.00
No. 1 busheling.....	12.00 to 12.50
No. 1 boilers, cut to sheets and rings..	11.00 to 11.50
No. 1 cast scrap.....	14.50 to 15.00
Stove plate and light cast scrap.....	10.75 to 11.25
Railroad malleable.....	13.00 to 13.50
Agricultural malleable.....	11.00 to 11.50
Pipes and flues.....	10.75 to 11.25
Railroad sheet and tank scrap.....	10.50 to 11.00
Railroad grate bars.....	10.50 to 11.00
Machine shop turnings.....	10.50 to 11.00

It is understood as the result of a conference between Governor Stubbs of Kansas and Vice-President Clarke of the Missouri Pacific, that the sum of \$780,000 is to be spent on the Central Branch of the road during 1910 for improvements, including 100 miles of new steel rails.

The Osage Western Railroad will build westward from Pawhuska in the Osage Indian Nation during the coming year. It is to be built, it is understood, as a branch of the Missouri, Kansas & Texas, connecting with the Coffeyville-Oklahoma City Division.

A steel and concrete bridge will be built over the lagoon near Lincoln avenue, East St. Louis.

The J. C. Kupferle Foundry Company will erect new foundry buildings costing upward of \$100,000 at Hall and Wright streets, North St. Louis.

Cincinnati.

CINCINNATI, OHIO, December 1, 1909.—(By Telegraph.)

While the situation in the pig iron market indicates a waiting attitude on the part of buyers and a corresponding independence among producers, there is little difference in the finished material market. Prices are firm on steel bars, structural shapes and sheets, and deliveries are if anything further off. Very optimistic are leaders in all branches of the iron and steel trades, and the great number of new projects, enlargements and additions outlined for an early beginning in the new year bespeak a continuation of the good business of the last half of 1909.

Pig Iron.—The turn of the month finds existent the most confirmed kind of holiday indifference in the iron markets. There is absolutely no spot market, and the shrewd seller, be he furnaceman or foundryman, with a surplus of iron, is not trying to force things at this particular juncture. The widely published opinions of a large Southern ironmaster have undoubtedly influenced the consumer somewhat, and it is believed by conservative furnace interests that it is best to step aside for the next 30 days at least and allow the speculator, who must unload during December, to rule. The question of \$14.50, Birmingham, for No. 2 foundry for December delivery, therefore, strictly speaking, is the resale price, few furnaces caring to bother with the business in the light of January and first quarter expectations. A careful authoritative estimate of the amount of this Southern resale iron thrown on the December market is 20,000 to 30,000 tons. While \$14.50 is the uniform asking price, it is believed that few holders would turn down a firm offer of \$14 flat. This belief is strengthened by the rumor that a few sales of December iron have been made on the \$14.50 basis to special customers with a proviso that deliveries may be extended into the first months of the year. No furnace interest can be found, however, to have authorized any quotation of less than \$15 for first quarter and half, and that is the open price in this market on new year deliveries. Southern furnace interests are described as being in excellent shape to carry stocks for from six months to a year. Northern interests are in relatively better shape, and while there is a little resale iron on the local market, nothing better than \$17, Ironton, for No. 2 is heard, which is really the furnace price, with a range to \$17.50, deliveries extending through any part of the half year. An upset price of \$105,000 has been put on the furnace of the Bird Iron Company at Ironton, to be offered at auction December 4. This is the only idle stack in this territory. The well sustained interest in the forge and low grades has now broken and the price has receded at least 50c.; \$13.50, Birmingham, could be done on a good sized tonnage, and, perhaps, \$13.25.

Mill cinder is selling well, the price ranging from \$3.25 to \$3.90, f.o.b. southern Ohio furnace, for next year delivery. The only inquiries heard in this market are for 500 to 1000 tons of special low phosphorus steel making iron for first half, probably Southern territory, and one from the largest pipe interest for some iron for shipment to its Burlington, N. J., plant. For prompt delivery and remainder of the year, based on freight rates of \$3.25 from Birmingham and \$1.20 from the Ironton District, we quote as follows:

Southern coke, No. 1 foundry.....	\$18.25
Southern coke, No. 2 foundry.....	17.75
Southern coke, No. 3 foundry.....	17.25
Southern coke, No. 4 foundry.....	16.75
Southern coke, No. 1 soft.....	18.25
Southern coke, No. 2 soft.....	17.75
Southern gray forge.....	16.50
Southern mottled.....	16.25
Ohio silvery, 8 per cent. silicon.....	20.20
Lake Superior coke, No. 1.....	\$18.70 to 19.20
Lake Superior coke, No. 2.....	18.20 to 18.70
Lake Superior coke, No. 3.....	17.70 to 18.20
Standard Southern car wheel.....	24.75 to 25.25
Lake Superior car wheel.....	21.75 to 22.25

(By Mail.)

Coke.—Improvement is noted in all districts in the matters of car shortage, labor and deliveries, which were agitating producers and affecting quotations for a few weeks. Some good sized contracts are reported from the Connellsville District, both for furnace and foundry grades, covering the next six months. Some difficulty is experienced in getting spot coke, because of unfamiliarity with locations of extra stocks on yards. It is reported that some belated buyers have offered \$3.50 per net ton at oven for foundry coke for the next six months, and the quoted price on Connellsville 72-hour foundry is \$3.35 to \$3.50; on the furnace grades, \$2.90 to \$3. New River grades are quotable at \$2.75 to \$3.50 for foundry, with a spot price of \$3.25, and for furnace, \$2.75. Pocahontas District producers are asking about \$2.75 for furnace, and \$2.75 to \$3 on spot and contract foundry. Wise County furnace grades are selling at \$2.35 to \$2.50 per net ton at oven, and \$2.50 to \$2.75 on contract.

Structural Material.—As the end of the year approaches some large users of shapes and plates in this district will find it necessary to renew contracts for next year, and under the stimulus of this expected business, with the rapidly improving conditions among jobbers and congestion at the mills, the trade would not be surprised at the announcement of an early advance. The American Bridge Company has taken some little railroad business for improvements on the lines of the Big Four, part of the New York Central system and the Cincinnati, Hamilton & Dayton. No large structures needing shapes are announced for the early part of next year in this territory. Beams and channels up to 15 in. for reasonably prompt delivery are quoted at 1.70c., Cincinnati, and small lots bring 1.75c. to 1.80c.

Bars.—Some of the large independents, notably Cambria, have withdrawn quotations from branch offices and are asking that all proffered business be put up directly to the mills. Regular customers are being taken care of, but new business is difficult to place. Considerable spindle steel is sold here to the machine tool trade, and on this class of business 2.25c., Pittsburgh, or 2.40c., Cincinnati, is about the ruling price. For smooth finished machinery steel the quoted price is 2.15c., Cincinnati. Iron bars are firm at 1.60c., Cincinnati. There is some contracting for the first half.

Old Material.—The present market on scrap is denominated by dealers as "peculiar"; there is no movement, but sellers regard the tremendous pressure of the steel markets in crude and finished material as prophetic of an early recovery in the new year. Mills are known to be pretty well stocked with scrap, but the melt is gaining all the time, and it is felt that the first of the year will bring heavy inquiries for second quarter and even further ahead. The railroad lists in this section are pretty well cleaned out for this year, the last offering having been a good sized tonnage from the Norfolk & Western. There has been a fairly good movement in machinery cast scrap, and \$13.50 to \$14 is about representative of the market. There is no business between dealers, and very little actual buying from any source on melting steel or other items heading the list. In the absence of business the following prices are given as about representative of the market, and are f.o.b. Cincinnati:

No. 1 R. R. wrought, net ton.....	\$14.00 to \$14.50
Cast borings, net ton.....	8.00 to 8.50
Heavy melting steel scrap, gross ton...	15.00 to 16.00
Steel turnings, net ton.....	9.00 to 10.00
No. 1 cast scrap, net ton.....	13.50 to 14.00
Burnt scrap, net ton.....	10.00 to 10.50
Old iron axles, net ton.....	18.50 to 19.00
Old iron rails, gross ton.....	18.00 to 18.50
Old steel rails, short, gross ton.....	15.00 to 15.50
Old steel rails, long, gross ton.....	16.00 to 16.50
Relaying rails, 56 lb. and up, gross ton...	22.00 to 22.50
Old car wheels, gross ton.....	15.50 to 16.00
Low phosphorus scrap, gross ton.....	17.50 to 18.00

Sheets.—All mills in this district are running full, and some so situated that they can do it are taking premiums ranging from \$1 to \$2 per ton for prompt delivery. Jobbers, anticipating the usual holiday slack time, are looking forward

to this period to get in on early first and second quarter business not yet placed, and the mails of the closing days of the month are filled with inquiries of this character. No. 28 galvanized is quoted at 3.50c., Pittsburgh; corrugated roofing sheets at 1.70c., Pittsburgh, per square for painted and \$3 for galvanized, 2½-in. corrugations.

The German Iron Market.

BERLIN, November 18, 1909.

The market has been more than usually quiet. No further price advances have been reported. The event of chief interest is the renewal of the contract between the Prussian railroad authorities and the Steel Syndicate for rails, ties and miscellaneous supplies for the State railroads for two years. When the contract was last renewed, two years ago, for a period ending March 31, 1911, the turn in the tide of prosperity had already set in. Nevertheless the syndicate was able to induce the authorities to pay 120 marks for rails and 111 marks for ties, which meant an increase of 8 marks for the former and 6 marks for the latter. The Government was much criticised at the time for paying higher prices in a falling market, and the Railroad Minister, in order to break the force of the attacks upon him, has been calling for unusually light quantities of rails and ties since then. His contracts did not specify the amounts that he had to take. The prices under the new contracts are lower by 4 marks per ton than those of the old contracts, and the Minister still retains a free hand as to the quantities to be taken.

In connection with the renewal of this contract it is pointed out in the press that the German rail makers have no grounds for being satisfied with the workings of the international convention in steel rails, the division of territory between the chief producing countries being evidently to their detriment. As proof of this it is mentioned that the exports of steel rails from Germany during the first eight months of this year dropped to 229,700 tons, from 271,400 tons last year, whereas the exports from England rose in the same time from 284,000 to 406,400 tons.

At the meeting which raised the price of bars, mentioned last week, it was announced that all the bar mills are sold to their utmost capacity to the end of March, and that orders for delivery after that period are coming in daily. Most of the big mills of the syndicate companies are turning out bars beyond their allotments, the latter not having any binding force. At the same meeting the suggestion was made to transform the agreement in bars into a regular syndicate, but opinions were expressed showing that there is very little prospect of this being done. It was, however, voted to give the agreement a broader scope, and a new meeting will be held in several weeks to carry this decision into effect. The advance of 2 marks in bars is without practical significance, since it only lifts the official price to the minimum price—namely, 104 marks—at which any of the mills are now selling bars. Not a few are asking 110 marks.

The organization of the heavy plate trade previously reported was accompanied with the adoption of minimum prices of 110 marks for ordinary plates and 120 marks for boiler plates. These prices hold for the first quarter of 1910, and it was voted to take no further orders at present for remoter dates. The mills hope to improve their position in carrying out this agreement. The prices hitherto prevailing, 108 to 115 marks, were regarded as very unsatisfactory. Mills running on thin sheets are well occupied, and they are now asking 130 marks a ton on new business. Plates of medium thickness sell at 120 to 122.50 marks. There is a good export demand at prices running 4 or 5 marks higher.

The October shipments of the Wire Rod Association amounted to 32,000 tons, of which fully one-third was exported. The orders on hand amount to 75,000 tons, of which 30,000 tons is for export. It is hardly expected that the association, at its meeting next week for fixing next year's prices, will adopt a higher schedule in view of conditions in the money markets.

It has been announced in the newspapers here that the Stettiner Chamottefabrik and the Berlin-Anhaltische Maschinenbau-Aktiengesellschaft have made an arrangement with the Bethlehem Steel Company to establish by-product coke oven plants in the United States in the form of a joint stock company. The capital is stated at \$8,000,000, which will be supplied by the Deutsche Bank of Berlin.

The plans of the huge Gelsenkirchen Company for its new works near the French frontier, referred to some months ago in this correspondence, have now been more fully made known. There will be a battery of blast furnaces having a capacity of 500,000 tons of iron yearly, besides a steel plant and rolling mills. The power plant will embrace 40 boilers.

The red iron ore mine near Attalla, Ala., which has supplied Chattanooga furnaces for some time, has been purchased from D. P. Montague by C. E. Stewart and associates. The monthly output has been about 4000 tons. Mr. Stewart is in charge of operations.

Iron and Industrial Stocks.

NEW YORK, December 1, 1909.

The stock market has been under considerable pressure, which is ascribed partly to the Standard Oil decision, partly to the approaching session of Congress and partly to the fear that the President may make some recommendations in his message to Congress which will not be agreeable to business interests. The range of prices on active iron and industrial stocks from Friday of last week to Tuesday of this week was as follows:

Allis-Chalm., com.. 15 - 15 1/4	Railway Spr., com.. 48 7/8 - 51
Allis-Chalm., pref.. 52 1/2 - 55 1/4	Railway Spr., pref.. 107 1/2 - 108
Beth. Steel, com.. 34 - 35	Republic, com.. 44 1/2 - 50
Beth. Steel, pref.. 67 1/2 - 68	Republic, pref.. 105 1/2 - 108
Can, com.. 13 1/2 - 14 1/4	South. I. & S., com.. 24 1/2 - 25
Can, pref.. 82 1/2 - 84 1/4	Sloss, com.. 86 1/2 - 89
Car & Fdry, com.. 69 1/2 - 73 1/4	Pipe, com.. 32 1/2 - 33
Car & Fdry, pref.. 119 - 121	Pipe, pref.. 84 - 84 1/4
Steel Foundries.. 63 - 64 1/4	U. S. Steel, com.. 85 1/2 - 90
Colorado Fuel.. 47 1/2 - 50 1/4	U. S. Steel, pref.. 122 1/2 - 125
General Electric.. 159 1/2 - 161 1/4	Westinghouse El.. 81 - 85 1/4
Gr. N. ore cert.. 77 1/2 - 80 1/4	Va. I. C. & C.. 71 - 71 1/2
Int. Harv., com.. 102 1/2 - 108 1/4	Chi. Pne. Tool.. 38 - 38 1/2
Int. Harv., pref.. 122 - 123	Cambria Steel.. 46 1/2 - 47
Int. Pump, com.. 48 1/2 - 51	Lake Sup. Corp.. 27 - 27 1/4
Int. Pump, pref.. 88 1/2 - 89 1/4	Warwick.. 11 - 11 1/2
Locomotive, com.. 59 1/2 - 61 1/4	Crucible Steel, com.. 14 - 15
Locomotive, pref.. 115 - 115 1/2	Crucible St., pref.. 87 1/2 - 89 1/4
Nat. En. & St., com.. 21 1/2 - 22 1/4	Harb.-W. Ref., com.. 40
Pressed St., com.. 50 - 52 1/4	Harb.-W. Ref., pref.. 94 - 95
Pressed St., pref.. 105 - 105 1/2	

Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 88 1/4, preferred 123 1/2, bonds 104 1/4; Car & Foundry common 72, preferred 119; Locomotive common 60 1/2, preferred 115; Steel Foundries 64; Colorado Fuel 49 1/4; Pressed Steel common 51, preferred 104 1/4; Railway Spring common 50; Republic common 45 1/2, preferred 105 1/4; Sloss-Sheffield common 86 1/2; Cast Iron Pipe common 32, preferred 84; Can common 13 1/2, preferred 83 1/4.

Iron and Steel Bonds.

Chisholm & Chapman, 18 Wall street, New York, furnish the following quotations:

	Bid.	Asked.
Bethlehem Steel 1st ext. 5s, due January, 1926..	89 1/2	90 1/2
Bethlehem Steel purchase money 6s, August, 1908..	119 1/2	119 1/2
Buffalo & Susquehanna Iron 1st 5s, June, 1932..	99 1/2	100 1/2
Buffalo & Susquehanna Iron deb. 5s, January, 1926..	97 1/4	97 1/4
Dominion Iron & Steel 5s, July, 1929..	95 1/2	96 1/2
La Belle Iron 1st 6s, December, 1923..	104	104 1/2
Lackawanna Steel 1st 5s, April, 1923..	98 1/2	99 1/2
Maryland Steel 1st 5s, February, 1922..	103	103 1/2
Pennsylvania Steel 1st 5s, November, 1917..	101	101 1/2
Pennsylvania & Maryland Steel 6s, September, 1925..	110 1/2	110 1/2
Republic Iron & Steel 1st 5s, October, 1934..	101 1/2	102 1/2
Sloss Iron & Steel 1st 6s, February, 1920..	95 1/2	96 1/2
Sloss Iron & Steel consol. 4 1/2s, April, 1918..	106	106 1/2
Jones & Laughlin 1st 5s, May, 1939..	101 1/2	102 1/2

United States Steel Corporation.

Collateral Trust 5s, Series A, C, E, April, 1951..	114 1/2	115 1/4
Collateral Trust 5s, Series B, D, F, April, 1951..	114 1/2	115 1/4
Sinking Fund 5s, April, 1963..	104 1/2	105
Union Steel 1st 5s, December, 1952..	104 1/2	105 1/4
Clairton Steel 5s, 1908-1913..	100	100
St. Clair Furnace 1st 5s, 1910-1939..	100	100
St. Clair Steel 1st 5s, 1908-1926..	100	100
Illinois Steel deb. 5s, January, 1910..	100	100
Illinois Steel 5s, April, 1913..	100	100

All bonds quoted "and interest."

It is expected that at the next meeting of the Board of Directors of the Crucible Steel Company of America, Pittsburgh, to be held this month, the stock will be placed on a 7 per cent. annual basis.

The Nova Scotia Steel & Coal Company directors have declared a cash dividend of 1 per cent., payable January 15, and have recommended a stock bonus of 20 per cent. to stockholders of record December 20, 1909. The new stock issue will participate in the dividends.

The Preferred Stockholders' Committee of the Tidewater Steel Company, Chester, Pa., announces that the sale of the plant to the Delaware River Steel Company realized sufficient to pay off the floating debt and to pay 20 per cent. on the par value of Tidewater Steel Company preferred stock in 6 per cent. bonds. The Delaware River Steel Company has an authorized capital stock of \$500,000, of which \$300,000 has been paid up in cash, and a bonded debt of \$250,000, interest at 6 per cent., \$100,000 of the bonds to be paid on November 20, 1910, and \$75,000 on the same date in 1911 and 1912, respectively.

An offering is being made of \$1,764,000 first mortgage 5 per cent. gold bonds of the Standard Steel Works Company, Burnham, Pa., due January 1, 1928. Outstanding bonds at present amount to \$2,038,000. Net earnings for 1909, two months estimated, are put at \$1,000,000; bond interest \$190,000, sinking fund \$200,000. The average net earnings in the five years, 1905 to 1909, were above \$600,000 a year.

Dividends.—The Republic Iron & Steel Company has declared the regular quarterly dividend of 1 1/4 per cent. on the preferred stock, payable January 1.

The International Silver Company has declared the regular quarterly dividend of 1 1/4 per cent. on the preferred stock, payable January 3.

The National Enameling & Stamping Company has declared the regular quarterly dividend of 1 1/4 per cent. on the preferred stock, payable January 3.

Trade Publications.

Car Unloading Chutes.—Quick Unloading Car Chute Company, Birmingham, Ala. Circular. Describes a device for use in loading wagons from cars, which can be adjusted to fit any size car or wagon. It is made of sheet steel and angle iron, and hooks to the top of the car, after which the shovellers in the car load the chute, which is a box-like arrangement with three sides, with a trap in the bottom. Two of the chutes can be used on one car to expedite the unloading. An illustrated description of the chutes appeared in *The Iron Age* October 7, 1909.

Exhaust Heads.—B. F. Sturtevant Company, Boston, Mass. Booklet. Contains a brief description of the Sturtevant exhaust heads, which are designed for steam pipes up to 36 in. in diameter and contains price-list and dimension tables.

Mechanics' Tools.—Buffum Tool Company, Louisiana, Mo. Two catalogues. Catalogue No. 1, section A, 7 x 10 in., 52 pages, is devoted to small tools for machinists and mechanics, such as cold chisels of all kinds, center punches, nail sets, screw drivers, bearing scrapers and combination tool sets for engineers, machinists, automobilists, &c. Catalogue No. 1, section F, is 7 x 10 in., 24 pages, and is devoted exclusively to cement workers' tools, such as step corner tools, jointers, indentation rolls for corrugating on driveways and walks to prevent slipping, concrete tampers, trowels and similar equipment.

Pyrometers, Recording Thermometers and Belt Lacing.—Bristol Company, Waterbury, Conn. Four bulletins. No. 108 deals especially with the application of pyrometers to hardening and tempering furnaces, showing the type of instrument, records and the method of applying the patented form of Thermo-couple to the most generally used hardening furnaces. No. 112 shows the class 3 compensated recording thermometers. No. 113 gives a brief description of a patent belt lacing made by the company, and No. 115 deals with the application of electric pyrometers to furnaces for annealing and case hardening.

Mechanical Stokers.—Lehigh Stoker Company, Fullerton, Lehigh County, Pa. This is a stoker operated by a small steam motor with movable grates, the fuel being fed through a hopper to the grate. Several views of the stoker are given and it is briefly described.

Steam Specialties.—Eynon-Evans Mfg. Company, Philadelphia, Pa. Catalogue No. 10, 6 x 9 in., 197 pages. Views of the company's plant and main offices are given, after which is shown a line of steam specialties, including injectors, jet and surface condensers, air pumps, centrifugal water pumps, steam jet blowers, ventilators, air compressors and exhausters, fan blowers, water heaters, siphons, valves of all descriptions, &c. The volume is especially well arranged and dimensions are given of every appliance shown, which is helpful to engineers when sketching layouts of plant equipment.

Molding Machines.—Arcade Mfg. Company, Freeport, Ill. Catalogue No. 23, 6 x 9 in.; 22 pages. The operation of molding machines in general is fully described and illustrations show the various movements. The feature of the company's standard molding machine is a pneumatic vibrator which can be applied where compressed air supply is available. This device automatically vibrates the pattern as soon as the sand in the mold is pressed to the proper density, and continues in operation until the patterns are withdrawn from the sand. Attention is also called to the Norcross jolting machine, which is built to ram large heavy molds which are usually produced by floor molders. Typical castings made on the machines are shown.

Nonferrous Metals.—Progressive Metal & Refining Company, Milwaukee, Wis. Folder. Contains a view of the company's recently completed plant, which is one of the most modern and up to date of its kind in the West. Correspondence is solicited regarding nonferrous metals, including Lake ingot copper, red ingot brass, yellow ingot brass, white metals, scrap metal and foundry residues.

Car Moving Machines.—Stephens-Adamson Mfg. Company, Aurora, Ill. Illustrated folder with return postcard. Calls attention to the Sheldon compound lever car mover and the car pulling machines made by the company. The latter are belt driven geared machines built in three sizes, designed to handle from 6 to 20 loaded cars. Style No. 17 of this equipment is inclosed in cast iron casing, exposing only the driving pulley and windlass. These machines are also made for direct connected electric motor drive. A general catalogue issued by the company shows many different styles of car pullers.

Turret Lathes.—Jones & Lamson Machine Company, Springfield, Vt. Catalogue. Size, 6 x 9 in.; pages, 253. Cloth binding. Entitled "Machine Building for Profit and the Flat Turret Lathe." The first section is a treatise of the business of building machine tools and in particular the Hartness flat turret lathe. To the description of the latter the remaining section is given, describing it in detail and illustrating its uses and the character of the work produced. The book has so much of educational value that it can hardly be classed as a catalogue, and has accordingly been given a book review notice under "New Publications" in another part of this issue.

Metal Market.

NEW YORK, December 1, 1909.

THE WEEK'S PRICES.

Cents per Pound.

	Copper.			Lead.			Spelter.	
	Lake.	Electro-lytic.		New York.	St. Louis.		New York.	St. Louis.
Nov.	14.60	13.75	31.25	4.40	4.27½	6.40	6.25	6.25
27.....	14.60	13.75	31.25	4.40	4.27½	6.40	6.25	6.25
29.....	13.75	13.50	31.25	4.40	4.27½	6.40	6.25	6.25
30.....	13.75	13.25	31.60	4.40	4.27½	6.40	6.25	6.25
Dec. 1....	13.75	13.25	31.75	4.40	4.27½	6.40	6.25	6.25

Copper.—The copper market is uncertain. Very little buying has been done the past week, and yesterday and to-day there was not enough purchasing to make a positive price. Last Friday the United Metals Selling Company came back in the market and disposed of some small lots of copper, after which the company withdrew, and from that time on the situation has been in the hands of smaller sellers. Most of the transactions that have been made have been in small lots and the prices that have been obtained varied considerably. It is apparent that the proposed copper merger is off for the present. Electrolytic copper was quoted to-day at 13.25c. and lake 13.75c. Casting copper is still quoted at 13.50c., which is considered by some a high price for this grade. There is a better quantity of it on hand, however, and it is thought that the price may go off somewhat. In London to-day spot copper was sold for £58 5s. and futures for £59 7s. 6d. The sales amounted to 450 tons of spot and 350 tons of futures. So far this month 23,878 tons of copper have been sent abroad.

Waterbury Average.—The Waterbury average for November was 13.62½c.

Pig Tin.—The tin market is uncertain despite the fact that good prices have prevailed during the week. The buying that has been done has not amounted to much, and even the speculative interests have been quiet. There has been less price cutting, and sellers seem to be agreed on the question of keeping the market above 31c. if possible. The tin statistics for November, compiled by C. Mayer, secretary of the New York Metal Exchange, show that deliveries into consumption during the month were very large, amounting to 4000 tons. The total for 11 months shows an increase of 7750 tons, compared with the same time last year. The combined deliveries of London and Holland for November were 419 tons larger than last year. For the 11 months the decrease in deliveries amounts to 541 tons, compared with the same time last year. Shipments from the Straits for November were 441 tons smaller than for the same month of last year. For the 11 months of this year the decrease in shipments amounts to 2780 tons, compared with the same time last year. Australia shipped 50 tons less in November, compared with the same month of last year. For the 11 months of this year the shipments were 555 tons smaller, compared with the same time last year. The total visible supply on November 30, 1909, was 72 tons above that of November 30, 1908. In London to-day spot tin sold for £143 15s. and futures for £145 10s. The market was steady.

Tin Plates.—The tin plate situation is unchanged. The buying continues heavy and deliveries are unsatisfactory. Smaller producers continue to ask premiums and buyers seem willing to pay as much as 20c. a box more than the regularly quoted price if they can thus get stock. The nominal price for 100 lb. I C coke plates is \$3.84.

Lead.—The demand for lead is very light. There has been some talk of price cutting in St. Louis, but here the outside interests are keeping their price up to that made by the American Smelting & Refining Company, which is still 4.40c. In St. Louis the price is 4.27½, and we hear of sales during the week at 4.25c., but mostly outside lots.

Spelter.—The demand for spelter has lessened, but the price has been keeping fairly steady during the week at 6.40c., New York.

Antimony.—The demand for antimony has improved and the price of Cookson's has stiffened somewhat. We quote Hallett's at 8.12½c. and Cookson's at 8.37½c. Other brands remain at 7.75c.

Old Metals.—Following are dealers' selling prices:

	Cents.
Copper, heavy cut and crucible.....	13.00 to 13.25
Copper, heavy and wire.....	12.50 to 12.75
Copper, light and bottoms.....	11.75 to 12.00
Brass, heavy.....	9.25 to 9.50
Brass, light.....	7.75 to 8.00
Heavy machine composition.....	12.25 to 12.50
Clean brass turnings.....	8.75 to 9.00
Composition turnings.....	10.25 to 10.50
Lead, heavy.....	4.20 to 4.25
Lead, tea.....	3.90 to 3.95
Zinc scrap.....	5.00 to 5.25

The Detroit Steel Products Company, Detroit, Mich., manufacturer of wrought steel Detroit-Fenestra window sash for industrial buildings, garages, &c., has appointed R. A. Rowland & Co., 1217 House Building, Pittsburgh, Pa., its selling representatives in the Pittsburgh District.

New York.

NEW YORK, December 1, 1909.

Iron Ore.—Witherbee, Sherman & Co. have opened their books for the sale of their 1910 output of Port Henry ores, which promises to be about 1,000,000 tons. The prices named are \$3.65 for Old Bed 21 lump ore, \$3.15 for furnace ore, 6¼c. a unit for Old Bed concentrates and 6¼c. a unit for Harmony ore, all f.o.b. Mineville. While these prices represent an advance of about 40 cents on the average for 1909, they are 60 to 80 cents a ton below the prices of 1907. Reservations are being made of the above ores, for acceptance before December 20.

Pig Iron.—A Delaware River pipe foundry has bought 5000 tons for January and February delivery, chiefly gray forge. In the basic iron sales of the past week, amounting to 46,000 tons, including 5000 tons of off iron, both Pennsylvania and New Jersey furnaces participated. While the foundry iron market is dull since most buyers are fairly well covered for the first quarter of next year, there has appeared in the past few days some inquiry for iron for the second and third quarters, and in some cases for the entire year. No strong buying is expected for such deliveries this month, in view of the unsettling effect of recent offerings of Southern iron. There are some indications, however, that portions of the warrant holdings of speculators, of which much has been heard lately, have passed into stronger hands. We quote New York prices as follows for early delivery: Northern No. 1 foundry, \$19 to \$19.25; No. 2 X foundry, \$18.50 to \$19; No. 2 plain, \$18.25 to \$18.50.

Steel Rails.—The Boston & Maine is in the market, but no contract has been placed as yet. The requirements of the New York Central and other Vanderbilt lines, concerning which a general announcement was made some weeks ago, are understood to be not the full programme for 1910. Thus far the awards include 14,500 tons for the Pittsburgh & Lake Erie, placed with the Carnegie Steel Company, and 38,000 tons for the New York Central, with the Lackawanna Steel Company, in addition to which is 77,000 tons that will be rolled in the Chicago District. The Colorado Fuel & Iron Company has sold 6000 tons of 90-lb. rails for early delivery to the San Diego & Arizona Railroad.

Ferroalloys.—Better prices for ferromanganese prevail, and some sales of fair sized lots have been reported at \$46 for the first half of next year. Ferrosilicon continues quiet, and we quote it at \$63.

Structural Material.—Orders are being taken in just as fast, or a little faster, than they are being turned out; deliveries which now average about three months are growing steadily longer. The week's business has been principally in moderate sized quantities, no especially large contracts having been closed with the exception of the Whitehall Building extension, 9500 tons. This is understood to have been taken by a Central Western fabricating concern. Bids will shortly be advertised for the new municipal building, 25 stories. The amount of material required is not definitely known, as the specifications are not out yet, but it is variously estimated at from 18,000 to 25,000 tons. Prices remain unchanged at 1.76c., tidewater, on plain material, mill shipments, and material out of stock brings 2c. to 2¼c. The leading mills are pretty well taken up for the first quarter.

Plates.—The market remains firm on plates generally, although one concern opened its books this morning with an advance to 1.86c., New York, for business for the next quarter. Generally there are not so large orders being taken here as in the West. Deliveries average on universal plates between three and four weeks, and on sheared plates one to two weeks, or about 10 days. Prompt shipments (a week or less) still bring a premium of \$2 to \$3 a ton. Except for the one advance noted, the price quoted is 1.76c., tidewater, although another interest is contemplating an advance within two or three weeks. No new large contracts were reported this week.

Bars.—There is no market change in the situation over that reported last week. A bar iron producer closed yesterday a contract with one of the large railroads for between 500 and 600 tons of test bars. The deliveries as before are much more prompt for iron than steel bars. The steel interests are practically sold up for the next three to six months, and are refusing some business. Steel bars are quoted at 1.66c., tidewater, where prompt deliveries are not required; ordinary refined bar iron at 1.70c. to 1.75c., New York, and test bars at 1.75c. to 1.80c., New York, carload lots. The congestion in the steel bar mills continues and the Eastern bar iron interests are working at full capacity.

Cast Iron Pipe.—The opening of new bids on the extension to the Brooklyn Water Works system occurs to-day. Much interest is being taken in view of the competition between steel riveted pipe and cast iron pipe. Next week the bids will be opened by the Department of Water Supply of this city on 1200 tons for Manhattan and 4800 tons for Queens. While some contracting for delivery next year is being done, the volume of business of this character has abated considerably, which is ascribed to the usual slowing

down in the closing weeks of the year. Carload lots of 6 in. are quoted at \$26 per net ton, tidewater.

Old Material.—With the exception of foundry stock, the demand for old material has been exceedingly quiet. Foundries are purchasing quite freely and values of cast scrap are well maintained. Malleable cast is particularly strong, as the supply is short and foundries are actively seeking for more of this class of material. Old car wheels have also shown considerable strength. Wrought pipe is in better demand than any other character of rolling mill stock. A great deal of steel scrap is now being offered, and the best bids which have recently been received on large offerings from interests here were not over \$17 at works in eastern Pennsylvania. The recent conditions in this branch of trade have been so discouraging that it is understood that some large dealers have practically decided to discontinue their operations in the old material market. Relaying rails are apparently in no demand whatever. Quotations are as follows per gross ton New York and vicinity:

Rerolling rails.....	\$15.50 to \$16.00
Old girder and T rails for melting.....	14.50 to 15.00
Heavy melting steel scrap.....	14.50 to 15.00
Relaying rails.....	20.50 to 21.00
Standard hammered iron car axles.....	23.50 to 24.00
Old steel car axles.....	20.50 to 21.00
No. 1 railroad wrought.....	16.50 to 17.00
Wrought iron track scrap.....	15.50 to 16.00
No. 1 yard wrought, long.....	15.50 to 16.00
No. 1 yard wrought, short.....	15.00 to 15.50
Light iron.....	9.50 to 10.00
Cast borings.....	9.50 to 10.00
Wrought turnings.....	11.00 to 11.50
Wrought pipe.....	13.75 to 14.25
Old car wheels.....	16.00 to 16.50
No. 1 heavy cast, broken up.....	15.50 to 16.00
Stove plate.....	13.00 to 13.50
Locomotive grate bars.....	12.50 to 13.00
Malleable cast.....	17.00 to 17.50

Judicial Decisions of Interest to Manufacturers.

ABSTRACTED BY A. L. H. STREET.

Sales—Warranty—Breach.—If an order be given to a manufacturer or dealer for a specific article of a known and recognized kind, and if the defined and described article be actually supplied, there is no implied warranty that it will answer the purpose intended by the buyer. If in a contract of purchase the buyer agrees that his retention of the article for more than 30 days without written complaint to the seller shall be a waiver of all "complaints, defects or damages," failure to give the prescribed notice precludes the buyer from setting up that the article is defective. (Georgia Court of Appeals, *City of Moultrie vs. J. S. Schofield's Sons Company*, 65 Southeastern Reporter 315.)

Freight—Validity of Provisions in Contract to Carry.—Arbitrary limitations of value and preadjustment of the damage in contracts of carriage of freight by railroad companies are invalid under the general law, and are likewise invalid under the Interstate Commerce act. (Georgia Court of Appeals, *Louisville & Nashville Railroad Company vs. Warfield & Lee*, 65 Southern Reporter 308.)

Shipment of Freight—Notice to Carrier of Contents.—In the absence of more definite information, a railroad company has the right to accept the shipper's marks as to the contents of a package offered for transportation, and is not bound to inquire particularly about them in order to take advantage of a false classification. A neglect on the part of the shipper to disclose the true nature of the contents of a receptacle offered for transportation is conduct amounting to a fraud on the carrier, if there be anything in its form, dimensions or outward appearance which is likely to throw the carrier off its guard, whether so designed or not. (Minnesota Supreme Court, *Harrington vs. Wabash Railroad Company*, 122 Northwestern Reporter 14.)

Sales of Goods—Right of Seller on Buyers' Failure to Pay Price.—When a bargain is completed for the sale of specific personal property for cash, and delivery is made, if the buyer fails to pay the price promptly, the seller has a right, as between the parties or against an attaching creditor, to reclaim the property, which is not lost by delay to assert it, unless an intention on his part is shown that the title should pass absolutely, and whether that is the case is ordinarily a question of fact, to be determined in view of all the circumstances. (Kansas Supreme Court, *People's State Bank of Michigan Valley vs. Brown*, 103 Pacific Reporter 102.)

Insolvent Partners—Right to Draw Salaries.—The partners of an insolvent firm have no right to draw salaries from the firm, but the entire proceeds of the firm's business must be applied to the firm indebtedness. (Colorado Supreme Court, *Miller vs. Electrical Supply & Construction Company*, 103 Pacific Reporter 290.)

Sales of Goods—Right of Buyer to Inspect Goods.—A buyer in an unperformed contract of sale of goods by sample without express warranty has the right to a reasonable opportunity to inspect the goods within a reasonable time

as a condition precedent to the passing of title. (Utah Supreme Court, *Wall Rice Milling Company vs. Continental Supply Company*, 103 Pacific Reporter 242.)

Stores—Negligence—Stairways.—It is not negligence for a mercantile firm to maintain an open stairway in its store-room, enclosed except in front; and it is not liable for an injury received by a customer, who fell down such stairway in the day time when the place was light. (United States Circuit Court of Appeals, Eighth Circuit, *F. W. Woolworth & Co. vs. Conboy*, 170 Federal Reporter 934.)

Store Fixtures—No Abandonment.—Movable trade fixtures owned by a tenant storekeeper in connection with his store are not abandoned to the landlord by the tenant accepting a new lease, containing no reservation of a right to remove the fixtures at the end of the term, or mention of any claim thereto. (Kentucky Court of Appeals, *Thomas vs. J. W. Gayle & Co.*, 120 Southwestern Reporter 290.)

Bankruptcy—Concealment of Property from Trustee.—Where a retail merchant, three months prior to his bankruptcy, had a stock worth \$5000, to which he afterward added \$10,500 worth, which was more than his business required, and failed to account in any way for goods to the value of \$4000, accepting the valuation given by himself in his schedules on his remaining stock, such facts were sufficient to sustain a finding that he concealed property from his trustee, and an order requiring him to turn the same over. (United States District Court, Middle District of Pennsylvania, in re *Averick*, 170 Federal Reporter 521.)

Presses which make possible the manufacture of automobile parts and similar stamped products are being installed by the H. A. Matthews Mfg. Company, Seymour, Conn. They will cut and draw such parts as automobile brake drums from ¼-in. stock up to 16-in. diameter. One of the double acting cam presses is said to be the largest of its kind ever built. Contracts for most of the machinery which is to be installed have been awarded. The new building for this extension of the company's line of product will be 60 x 102 ft., two stories, of cement construction, including a roof of cement shingles. The company manufactures sheet steel bicycle fittings, stove trimmings and specialties of steel and brass.

The court at Pittsburgh has granted a preliminary injunction in the suit of the Golden-Anderson Valve Specialty Company against the Monessen Foundry & Machine Company, restraining the defendant from further alleged infringements of certain patent rights until further order of court upon final hearing. Anderson, formerly a member of the complainant company, is now with the Monessen firm.

The Ferro Machine & Foundry Company, Cleveland, Ohio, states that its recent foundry organization banquet celebrated the turning out of 1100 automobile cylinder castings on November 6. Those interested in the automobile industry will especially appreciate the magnitude of this feat. It is believed to be the highest production of this type of intricate casting ever turned out by any foundry in the world.

The Braden Mfg. Company, Terre Haute, Ind., making down spouts, gutters and similar building material, according to reports, is to erect a larger plant, of three stories, with floor space of 50,000 sq. ft. The company expects to add a department for the building of galvanized tanks and like products when in its new plant, which will be several times larger than the present quarters at Fourteenth and Tippecanoe streets.

The Goulds Mfg. Company, Seneca Falls, N. Y., has been advised by the directors of the Alaska-Yukon-Pacific Exposition that its exhibit has been awarded medals. This award was the only one made on pumps of the company's type of manufacture, and, therefore, the highest award at that exposition for triplex power pumps.

The Dodge Mfg. Company, Mishawaka, Ind., is manufacturing a bearing metal which has recently been turned to use in a direction which had not been contemplated by the company. Counterfeiters have been struck by its similarity in appearance to silver, and spurious coins made of it have been found in western New York.

The Machinery Trade.

NEW YORK, December 1, 1909.

Some large projects have come forward since our last report which are expected to result in the placing of extensive orders for machinery within the next few months. These with the steady volume of inquiries and orders for small lots, which gives evidence of expanding at a rapid rate, indicate a demand at the beginning of the new year far in excess of that at the present time. Advices from the West and points in the East outside of the New York territory are to the effect that the railroads will shortly come into the market for extensive lists of machine tools. Among them are the Pennsylvania Railroad and the Oregon Short Line, the latter having issued a list of tools aggregating about \$100,000. The New York Central Railroad is also looked to for considerable business. The past week showed little variation in actual transactions, the betterment being more in the nature of inquiries. In view of the approach of the new year this is only natural, as it is always the tendency in December to withhold orders so that they will be charged in the next year's account. With many houses this condition slightly affected their business the past month—that is, the rate of improvement experienced in September and October was not maintained in November. Business the past month, however, was very good and some houses booked as much, if not more, business than they have for any month for some time.

The sale of electric motors for machine drive is not as good just now as the general demand for machinery might seem to warrant. This is explained, however, by the fact that many manufacturers who are buying equipment are saving themselves as much trouble as possible and rather than change their power over for a few machines are utilizing shafting they have in use and using belt drives. The motor drive equipment people are obliged to look to new enterprises for most of their trade, as where an entirely new installation is being made it makes but little difference, as regards work and trouble, what power is used. As has been said, however, most manufacturers who are simply adding to their shop equipment are too busy to take up new problems and in consequence the trade in electric motors for this class of work is not keeping pace with the general demand for other lines of machinery.

Extensive Railroad Requirements.

From Philadelphia come reports to the effect that the Pennsylvania Railroad will shortly come into the market for an extensive lot of machine tools. This road has purchased very little within the past two years, and it has been expected for some time that the road would come into the market quite extensively as soon as its own business reached proportions that necessitate the operation of its various shops to capacity. It is generally thought that this condition has now been reached and that it has been found necessary to install a great deal of additional machinery at an early date. While it may be some weeks before the road will be ready to get bids on its requirements, the reports indicate that these will be quite extensive. It is likely that the appropriation for the mechanical department will carry a considerable amount of money for the purchase of machine tools and possibly some power equipment.

Among the items of expenditure covered by the recent bond issue of the New York Central Railroad authorized by the Public Service Commission are \$350,000 for extensive new car repair shops at East Buffalo, N. Y.; \$340,000 for car repair shops at Avis, Pa., on the Pennsylvania Division, with \$40,000 for machinery equipment; \$674,000 for the elimination of grade crossings at Buffalo and extensions to freight yards at East Buffalo; \$476,000 for double tracking the Niagara Falls branch; \$94,000 for rebuilding the bridge over the Erie Canal at Tonawanda, N. Y.; \$100,000 for additional land for passenger station at Buffalo, and \$1,500,000 for a new passenger station at Rochester, N. Y.

The Crawford Automobile Company, Hagerstown, Md., has inquiries in the market for a small lot of machine tools.

The General Electric Company, Schenectady, N. Y., whose buying has been quite large in this territory the last few months, is calling for additional requirements for the extensions to its plant at Schenectady which were recently erected. Some big orders have been placed with New York representatives of machinery houses during the last two weeks, and inquiries now in the trade denote that the company will do some additional buying.

The Only Car Company, Port Jefferson, N. Y., recently organized to manufacture motor cars, motor boats, &c., expects to have its new plant ready for operation next March, with an output of 1000 cars per year. The equipment will include automatic gear cutters, piston ring and cylinder grinders, turret lathes, multiple spindle drills and such other

machinery as is usually installed in an up to date machine shop of the capacity proposed. R. E. Loper is at the head of the enterprise.

The Sageng Threshing Machine Company, Midway, St. Paul, Minn., of which J. A. Anderson is superintendent, expects to spend between \$20,000 and \$25,000 in the purchase of additional machinery for its shops. The following machines are required: For boring and facing cylinders for gasoline engines, one 21 and one 24 in. turret lathe, one 8 and one 12 in. spindle adjustable multiple drill, one 12-in. slotting machine, universal table; one 2¼-in. lathe, one 24 in. by 6 ft. planer, one shafting key seater, one 30-in. horizontal milling machine, one grinding machine for crank shaft in size up to 2½ in. in diameter by 66 in. long, one cutting-off machine for shafting up to 4 in. in diameter, one double shafting lathe with center head hollow, to take 2½ in. in diameter shafting up to 7½ ft. between centers; one surface grinding machine, one cylinder grinding machine, one power hack saw, one emery wheel stand for 12-in. wheel, double spindle; one No. 2 milling machine, universal; one combined oil separator and filter, one wheel tire roller, with rolls about 10 in. in diameter by 36 or 48 in. long; one air chipping machine, one air drill, one air hand riveter, one air compression riveter. For the foundry there will be required one cupola, capacity of 12 tons per hour, of the latest and best style; one blower wind fan, one core machine, with tubes from ¾ in. in diameter up to 2 in.; one 1-ton scale for cupola, one 1-ton scale for chipping room, one 24 in. in diameter and one 36 in. in diameter tumbler, one emery wheel stand for 16-in. wheel, double spindle.

The Nelson Trading Company, Orange, N. J., is in the market for a general line of machinery for the manufacture of cutlery of all kinds, such as pocket knives, table cutlery, scissors, shears, manicure sets and razors. The company requires machinery for stamping and cutting blades, grinding machines, buffing machine, beveling machines, honing machines, stropping machines and other equipment for cutlery manufacture. The company can be addressed at Post Office Box 933, Orange.

The Max Ams Machine Company, Mt. Vernon, N. Y., recently secured a large contract for cutting transmissions which necessitated some additions to its machinery line and the company is now placing orders against these requirements.

The Federal Terra Cotta Company, 111 Broadway, New York, which was recently incorporated with an authorized capital of \$1,500,000, is preparing to build a plant at Woodbridge, N. J., for the manufacture of architectural terra cotta. The plant will be one of the largest of its kind in the country and as no machinery equipment has been purchased as yet the expenditures in that direction will be large. There will be a main building, 250 x 600 ft., and six other structures of equal length and somewhat less width, including a power house. The buildings will be constructed mainly of terra cotta. The company will use about 800 hp., but it has not been decided as yet whether a producer gas plant will be installed or whether the power will be purchased. A good deal of the machinery required will be special equipment for the manufacture of terra cotta, but standard conveying machinery and power accessories will be needed. The new plant will have siding connections with the Pennsylvania Railroad and deep waterway transportation facilities on Woodbridge Creek. The recently elected officers are De Forest Grant, president and general manager; Edwin Thorne, first vice-president; William Manice, second vice-president; Frank A. Thayer, treasurer, and Dwight W. Taylor, secretary. The directors are De Forest Grant, William Manice, John E. Berwind, Edward J. Statinius, Frank A. Thayer, Madison Grant, Dwight W. Taylor, Edwin Thorne, Rodney Thayer and William B. Dinsmore.

Catalogues Wanted.—The recent fire at the plant of the Bath Mfg. & Castings Company, Bath, Pa., only destroyed a portion of the building, the part left being large enough to allow the company to carry on operations until spring, when it expects to rebuild. At the present time the company has not yet prepared plans for the new structure. The catalogues were all destroyed and the company would be pleased to receive catalogues from manufacturers of such equipment as is used in a modern foundry and machine shop.

New England Machinery Market.

BOSTON, MASS., November 30, 1909.

General conditions of manufacturing continue to strengthen and the results are apparent in the machinery and supply trades. New England as a whole, considered as a buyer of machine tools, may have been somewhat disappointing of late when comparison has been made with some other parts of the country, but there now seems to be promise that the difference will soon end, and that in common with the rest of the East the market here will reach a maximum.

The industries of the Naugatuck Valley, in Connecticut,

are exceedingly prosperous. The brass mills are running full, in some cases with night shifts, even up to 22-hour daily schedules. Considering that capacity as a whole is greater than before the depression, production must be very close to any previous record. There is not, perhaps, the same extreme tension in the effort to procure a maximum of output, as characterized the business three years ago, but nevertheless the mills are turning out a tonnage equal, or almost equal, to any previous figures. The same conditions exist among the manufacturers of the valley who use brass as a raw material. The factories are full of orders. All records of production have been broken in more than a few cases. Here, again, capacity is much greater than ever before, so that with equal fullness of order books the output must be correspondingly larger.

Prices are advancing all along the line in the brass business, following the increased cost of copper and spelter, and also as the natural result of a new ratio of supply to demand.

These general conditions are reflected in the machinery business of Connecticut, especially in those shops which build metal working machinery other than machine tools proper. These plants are very busy indeed. Their orders are not by any means confined to the brass people; they are coming from all over the country and from other countries, and are for machines to work iron and steel as well as brass. Rivet, bolt and nut machinery, presses and hammers, thread rolling machines, hydraulic tools, wire working machinery, rolling mills, shears, slitters and more special types are included in the renewal of business. The builders of automatic machinery used in a very wide variety of manufacturing, such as wire-forming machines, are almost swamped with orders and inquiries. In some cases they have been able to draw from stock, for standard types of these classes of machinery may be accumulated, ready for the fitting of the special tool equipment designed to meet the exact requirements of the customer. But the stocks will soon be wiped out. A large percentage of inquiries are for machines so special as to preclude the use of standard designs, and are, therefore, regarded with correspondingly less favor by the builders.

Labor does not appear to be so scarce in the Naugatuck Valley as in some other parts of New England, but skilled mechanics are not easy to get.

The Baird Machine Company, Oakville, Conn., manufacturer of special machinery, presses and tumbling barrels, is planning a large addition to its shops, but has deferred building until spring. The company is very busy, orders for special machinery being especially numerous. Additional space has been procured for the machine shop by devoting to the purpose room formerly occupied for storage, a neighboring building having been hired to make this possible.

The Barlow Mfg. Company, Holyoke, Mass., manufacturer of store display fixtures, &c., is making important additions to its factory. An old building is being remodeled to give space for several departments, including the machine shop. A new building on land just acquired will be 45 x 55 ft., and two stories. On the first floor will be a boiler room and plating and assembling rooms. The second story will be used as a polishing room.

The Waterbury Farrel Foundry & Machine Company, Waterbury, Conn., has brought out an improved type of its reciprocating screw threader. The company has recently built a solid die double stroke geared header with a capacity of $\frac{7}{8}$ in. in diameter and 4 in. in length, which is believed to be the largest cold heading machine ever constructed.

The Fitchburg Steam Engine Company, Fitchburg, Mass., builder of reciprocating engines, is increasing its capacity by the addition of tools from time to time, the last machines purchased being a large radial drill and a special cylinder boring machine furnished by the Binse Machine Tool Company.

The Dwight Slate Machine Company, Hartford, Conn., is making radical changes in its line of machinery, under the new management which resulted from the reorganization of the business. The product will be simplified by elimination. The drills will be made more of a feature than ever, and the manufacture of metal marking machines, of which type the company is the sole manufacturer, will be continued. The present company is a new Connecticut corporation, with authorized capital stock of \$50,000, and having the same name as the old. Samuel E. Elmore is the president, Charles B. Elmore, vice-president and manager, and Martin Welles, treasurer.

Announcements of industrial expansion outside of the metal lines, include the following: Davidson & Watson, Clinton, Mass., factory 54 x 105 ft., two stories; Pawtucket Dyeing & Bleaching Company, Pawtucket, R. I., main building, 75 x 150 ft., two stories, bleach house, 158 x 158 ft., one story, and boiler, engine and filter house; Ponemah Company, Norwich, Conn., weave shed, 200 x 700 ft.

The Norton Grinding Company, Worcester, Mass., is bringing out a new machine, the purpose of which is to find the errors of running balance of cylindrical parts that the necessary corrections may be made. The company is also putting on the market an attachment for its standard

cylindrical grinder, for grinding cam shafts for automobile and marine engines from a solid piece of metal.

The Reed & Prince Mfg. Company, Worcester, Mass., manufacturer of machine screws, wood screws, rivets and bolts, will build an addition to its works, consisting of a two-story building, 90 x 240 ft. The space will be used for general purposes. The chief reason for building at this time is to give additional room on the ground floor for the installation of heavy machinery.

The Millett Brass Company, Springfield, Mass., manufacturer of brass and composition castings, will largely increase its plant by the addition of a one-story building, covering a space of 33 x 150 ft. and 33 x 50 ft. It will be of brick and steel construction. The company states that it is not yet prepared to tell what equipment will be needed. Probably nothing will be purchased immediately.

The plant of the Boston Gear Works, Quincy, Mass., was almost destroyed by fire November 27, with a loss estimated at \$125,000. It is understood in the machinery trade that only about one-third of the machine equipment can be put in condition for service again. The plant was modern throughout and contained many valuable tools. The business has grown rapidly, as the company serves a large clientele, especially in Boston and eastern New England generally. The works were located on High street, Boston, until about a year ago, when they were moved to Norfolk Downs, in Quincy. The temporary loss of the company's services will be widely felt among those who have depended on them for gear products.

The Universal Machine Screw Company, Hartford, Conn., manufacturer of multi-spindle screw machines and screw machine products, has made no final plans for its new shops which will be erected on the land acquired some time ago. The need of additional floor space is apparent, however, and doubtless building will begin in the spring, if not earlier. The new shop will contain at least 40,000 sq. ft. of floor space and will be one story, with the exception of that portion devoted to the office, which will have two floors. The site will be in the north section of the city, on the line of the New York, New Haven & Hartford Railroad.

Philadelphia Machinery Market.

PHILADELPHIA, PA., November 30, 1909.

While complete data showing the volume of business transacted during the month of November are not yet available, it is no doubt true that a large majority of both tool builders and merchants have made heavier aggregate sales than during the previous month. Some few good sized propositions, particularly in heavy special tools, were closed, while there has been an increasing demand for equipment of a miscellaneous character, orders for which have been largely in single tool lots. The last week of the month was fairly active, several sales, comprising a number of tools to one buyer, are reported by some merchants, but the bulk of the business has been of the single tool class. Merchants report a very fair run of inquiries, but are not, as a rule, expecting any heavy volume of business during the closing month of the year. There is a possibility of some heavier railroad buying after the turn of the year, as some roads are now having requirements looked into. Several odd tools have been purchased recently by roads in this district, but there has been nothing of an important character considered. Purchases, on the whole, have been of a pretty general character; sales of radial drills, lathes, shapers and an occasional milling machine are reported. The chief difficulty, merchants state, is that of obtaining satisfactory deliveries, which seem to be steadily hardening in practically every class of equipment. Owing to these conditions prices are decidedly firmer and higher figures in a number of lines are talked of pretty freely, but no definite advances have been recently made.

Manufacturers continue to book a good run of orders, coming from all sections of the country, those, however, originating in this particular territory continuing rather light. Increased activity is to be noted in nearly all the various plants in this district, the same difficulty in obtaining satisfactory mechanics being reported in quite a few instances. The number of industrial plants, general shops, &c., which have gone back on a normal basis of operation is steadily increasing. One of the large crane builders is now crowded up with business, while several small shops are operating on an overtime basis.

The foreign demand is unchanged, little new business comes out and makers doing an established business abroad report trade as being quiet.

The second-hand machinery trade continues moderately active; no extensive purchases have been reported, but there has been a somewhat better general demand owing to the increasing length of the time required for deliveries of new tools. The demand for second-hand boilers and engines continues irregular. The power equipment is in a little more

active demand, several pretty good size propositions in the way of general equipment for new plants being in sight.

Both iron and steel casting plants note a better inquiry for castings. Steel casting makers are, for the greater part, running at full capacity, and while there has been no general advance in price, conditions appear to be shaping themselves in that direction. Gray iron foundries are gradually becoming more active, there being more tonnage offered both in general as well as machinery castings.

The Philadelphia & Reading Railway, W. Hunter chief engineer, Reading Terminal Building, will receive bids until December 14 for several contracts in connection with the work pertaining to the abolishment of grade crossings on its lines in this city, contract No. 16 being for a passenger station at Tioga; No. 17 for a passenger station at Nicetown; No. 39 for storehouse and engine house changes in the Green street yard; No. 41 for an engine water supply system, Green street yard. Plans and specifications may be had from the engineer on payment of a small sum to insure their return.

Calvin W. Rogers, contractor, will erect for P. J. McGarvey, at 1229-1233 Belmont avenue, a two-story garage, 54 x 90 ft.

Plans have been completed by the architects for a proposed new plant for the Electric & Ice Mfg. Company, Pocomoke City, Md.

The Lebanon Valley Consolidated Water Company, Lebanon, Pa., has under consideration, it is said, the construction of a filter plant in the vicinity of that city, also the laying of additional pipe lines to convey water to outlying districts in that vicinity.

Henry E. Baton, builder, has a contract to erect for the J. G. Brill Company of this city an addition to its truck shop, 108 x 128 ft. on the ground plan, also for the erection of a crane runway, both of steel construction, the building being covered with corrugated iron.

The Pennsylvania Railroad has taken city permits for several improvements in its Frankford Junction yards, including among others a corrugated iron storage house, boiler and engine house, coal pocket and additional facilities for handling ashes.

M. B. Schantz, Allentown, Pa., has been appointed by the United States District Court in this city as receiver of the Traylor Engineering Company of Allentown, Pa. The receiver will, we understand, operate the plant for 60 days to complete unfinished orders.

Chicago Machinery Market.

CHICAGO, ILL., November 30, 1909.

The machinery trade of the West has settled down to the limitations on delivery from the mills. Dealers in Chicago report a good volume of current business for the past month, and the growth of the demand in general lines has covered the gap left in the business when the automobile people quit buying. Bare spots are beginning to appear on the floors of the large houses, where machines have been shipped from stock which cannot be replaced for some time from the shop. Inquiries are coming in for hammers, bolt cutters and odd lines where there has been no difficulty thus far in giving prompt delivery, and a general broadening tendency is noted each month in the business, with the factories falling steadily behind on milling machines, boring mills and even on lathes and shapers.

During the past month the railroads have become more active and there has been an unusually large volume of business done with them on special orders calling for one or two machines at a time. One local house recently had five inquiries in one day for five different machines, and there is a general tendency to buy in this manner instead of on more formal orders and lists. Extensive shop improvements are under way on many of the leading Western roads. It is understood that the Burlington Road will need considerable new equipment for the new shops at Havelock, Neb., which will be completed not later than July, 1910. The Great Western Railroad is being rehabilitated, and it is generally understood in the trade that the Chicago & Northwestern will erect extensive new shops next year near Chicago.

The Oregon Short Line has issued a list, under date of November 15, which it is understood will cover \$100,000 to \$150,000 of machine tools and other car shop machinery for improvements on that road. Thus far only a few dealers have been favored with copies of this list.

It is reported locally that the manufacturers of sensitive drills have made an advance of 10 per cent. in their prices, and it would occasion no surprise among the dealers if there were advances in the near future on lathes and some other lines. One leading manufacturer of machine tools is following the plan of a 5 per cent. advance every two months.

The A. D. White Machinery Company, Chicago, has secured the agency for this market for the Rhenania gear gen-

erating machine, manufactured at Cologne, Germany. The especial advantage claimed for this machine is that it will do 40 to 50 per cent. more work than the gear hobbing machines in general use. A worm hob is used and the work revolves steadily, so that the heat is distributed uniformly.

The Seibold-Speer Machine Company, Fort Worth, Texas, recently incorporated with capital stock of \$30,000, will erect a plant at that place, 60 x 200 ft., one story. Bids for machinery to be installed will be opened January 1. The officers of the company are: E. Seibold, president and treasurer; G. F. Speer, vice-president; F. H. Peters, secretary.

The Iowa Ditching Machine Company, Stockport, Iowa, will move its plant to Mt. Pleasant, Iowa, in the spring, as soon as a suitable building can be erected. The building to be erected will be of brick construction, 90 x 120 ft., which will contain an erecting room, 60 x 60 ft.; machine shop, 60 x 60 ft., and an engine room, with storage rooms on each side along the main building.

The Union Machine Company, St. Paul, Minn., incorporated with capital stock of \$25,000, has secured a plant, 25 x 140 ft., one story, at 164 University avenue, which it has equipped with modern machinery and tools for doing light manufacturing and repairing, and expects to be running by December 1. The company would appreciate catalogues bearing on machinery supplies.

A consolidation of the North Star Iron Works and Hammond Boiler Works, Hammond, Ind., has been effected, with officers for the ensuing year as follows: Wm. C. McEwen, president; Walter Williams, vice-president; Clyde H. Cass, secretary, and J. Franklin Blackmun, treasurer. The company will continue the same lines as formerly, with the addition of a house heating boiler and equipment department as a specialty. Additional real estate has been secured and some new machinery will be required. The capital stock of the company is \$20,000.

The N. S. Sherman Machine & Iron Works, Oklahoma City, Okla., is having plans prepared for a new plant.

The D. J. Murray Mfg. Company, Wausau, Wis., manufacturer of saw mill machinery, has in the course of construction an addition to its machine shop, 60 x 425 ft., strictly fireproof. The company has about completed a new foundry, 70 x 140 ft., of fireproof construction, with modern equipment. A new building, 35 x 70 ft., three stories, and divided into departments to be used as pattern vaults, has recently been completed.

The Security Stove & Mfg. Company, Kansas City, Mo., is erecting a new two-story brick factory building, 125 ft. square, which will double its output for the coming season. The new addition will cost about \$12,000. The company is now installing the latest equipment in every department of its factory. Each department will be equipped with individual current motors, and the new building will contain a modern nickel plating plant. The company is adding a large number of new patterns, and after January 1 will be in position to manufacture a complete line of stoves, at which time the capital stock of the company will be increased.

The Hammers Steam Plow Company, Manitou, Colo., contemplates the removal of its plant from that place, and is now in communication with Wichita, Kan., and several other places that are offering inducements, although it is quite probable that Wichita will be selected. The decision will be made in a short time. Machinery requirements for the new factory will consist of drills, lathes, planer, power hammer, large blower, bulldozer, punch and shear, thread cutter, general blacksmith tools; also foundry equipment, should the company decide to put in a foundry.

Cincinnati Machinery Market.

CINCINNATI, OHIO, November 30, 1909.

December promises to be a very interesting month in the metal trades and machinery manufacturing industry, in which all factors will be engaged for the greater part to the extent of their capacity. The one thing most noticeable about the local market conditions as the month of November closes is the uniformity which marks the distribution of orders and engagements among the machine tool, general machinery and boiler and engine concerns. The fall trade was for the most part spotty in character; the big orders of the automobile manufacturing plants for lathes, milling machines, grinders, &c., engaging concerns manufacturing those specialties to the utmost limits of their capacity, but those making the heavier lines of tools were busy only to 50 to 75 per cent. of capacity. During the month of November these conditions have gradually changed, and now the trade is more uniform.

Arrangements under way by the Executive and Entertainment Committee of the Cincinnati branch, National Metal Trades Association, promise for the last regular quarterly dinner of the year at the Business Men's Club, on

December 15, the greatest meeting in the history of the association. It is expected also to be the largest ever held under this jurisdiction. The speakers at the December dinner will be Dr. W. H. Tolman, director of the Museum of Safety and Sanitation of New York; subject, "Accident Prevention"; Edwin F. Bartlett, ex-president of the Boston Metal Trades Association branch, whose subject will be "Co-operation," and C. H. Norton of the Norton Grinder Company, Worcester, Mass., who will speak on "Industrial Development," taking up the thought of co-operation among American manufacturers and the development of a mutually helpful system for facilitating the handling of foreign competition. A special trainload of manufacturers from Muncie, Ind., will attend the meeting, and there will be also a number of prominent machinery men from Indianapolis and Cleveland. Invitations will go out from the office of Secretary J. M. Manley, Cincinnati, this week. At the meeting Secretary Manley will present some very interesting facts and figures showing the increasing engagement of forces in the Cincinnati field.

In the line of planers there is an increasing interest as shown by inquiries at the plants making a specialty of this line. Arrangements are under way by a concern which has been working on a new type of planer for the past three years to bring it out very soon; four examples of the finished machine which have been produced and undergone various exhaustive tests showing it to be a worthy exponent of this line of heavy tools. Upright drills continue in strong demand; one large plant making a specialty of this type working to its fullest capacity with orders booked which cannot be delivered before next March.

Although for a portion of November there was a cessation in buying on the part of the automobile plants, the close of the month sees some nice orders booked for early deliveries in heavy duty lathes. An order received by the R. K. Le Blond Machine Tool Company calls for about 20 of this type, sizes 16 to 20 in.

Business in pumping machinery for municipal plants continues good. The John H. McGowan Company's plant is engaged to its capacity in this department; a considerable portion of the business going to the South. This company is just completing for shipment to Temple, Texas, a large engine of the vertical type, 5,000,000 gal. capacity.

The Manufacturers' Club of Cincinnati has with the incoming administration, headed by W. F. Robertson of the Robertson Iron & Steel Company as president, taken on the spirit of aggressiveness and enterprise that characterizes the trade, and plans are being laid for a year of hard work. The club will announce a list of speakers of international fame. It will also take up matters of general civic pride and interest and co-operate with the other prominent quasi-public organizations.

Prominent machinery and machine tool manufacturers are advised of authority extended by the American Society of Mechanical Engineers to the University of Cincinnati, to form a student branch of the first named society. Among the universities so honored at present are Cornell, Leland Stanford, Stevens Institute and the University of Illinois. The charter members will include third and fourth year co-operative students in mechanical engineering and will number about 30 students. The students will invite prominent engineers to meet with and address them from time to time.

The Interstate Sanitation Company has been incorporated by Edward and P. T. Roach, August B. and Alfred A. Laing, and F. R. Gusweiler. The capital is \$50,000 and headquarters will be in Cincinnati, with branch offices in the principal cities of the United States. The company will manufacture oxygenating air purifiers.

The Joseph Goldberger Iron Company is a new incorporation of the week. This is the outcome of a meeting of those most interested to expand the old material business, which began some time ago from the sale of the old water works to Joseph Goldberger, formerly of Shelby, Ohio, and associates. It is the intention of the company, which has incorporated for \$100,000, to expand the business, install some machinery and add a number of improvements. These matters will be taken up by the Board of Directors at a meeting to be held this week to organize and elect officers.

At Dayton, Ohio, has been incorporated for \$15,000, the Dayton Castings Company by Joseph F. Westendorf, James S. Mitchell, John Westendorf, Oscar Schwegel, Clarence Westendorf, all of whom are interested in the business of the Ohio Foundry Company at Dayton. The new concern, it is reported, will be a subsidiary to that organization.

The Lake Shore Railroad has filed in the office of the Indiana Railroad Commission at Indianapolis plans for the erection of additional shop buildings at Elkhart that will cost upwards of \$600,000. This, it is said, does not include expensive equipment to be installed in the proposed new shops. This is taken as proof conclusive that the rumor saying that the shops would be removed from that city to some point East, is incorrect.

S. F. Bowser of S. F. Bowser & Co., Ft. Wayne, Ind., manufacturers of oil tanks, will erect a \$10,000 church building at Holton and Hurd streets, that city, and dedicate it to the purposes of the Free Methodist Church and in the

name of his son, Hughey Bowser. Mr. Bowser acquired the property on East Creighton avenue, on which the present church is located, and after the new one is completed this one will be razed and an important addition to the plant of the company built on the site.

A scarcity of laborers is complained of at the plant of the Ft. Wayne Rolling Mills, in Ft. Wayne, Ind. The present payroll is about 600, and something like 50 or 75 more are needed.

The American Steel Dredge Works at Ft. Wayne, Ind., is gradually approaching a state of completion, and the entire plant is expected to be put into operation before the first of the year.

Some extensive improvements are under way at the plant of the Leidecker Tool Company in Marietta, Ohio. More room is to be added to the drilling machine department and a new machine shop is a feature of the expansion. Some new machinery will be installed, it is reported, and a large coke bin affording special facilities in unloading is a part of the improvements outlined for early consummation. Some recent shipments of drilling machines were to the South and Southwest, one large one going to Mexico; another for a point in Arizona.

It is reported from Indiana that the Fort Wayne & Wabash Valley Traction Company has arranged to build a large power plant and car shops at Lafayette, Ind., and that it was decided also to greatly enlarge and improve the car repair shops of the company at Huntington.

Reports from central States territory through the pig iron brokerage and commission houses indicate that the jobbing foundries of the district are all engaged, and most of them to capacity. There is a little uneasiness among the foundrymen over reported increase in price of machine tools; that is, those that make castings for this class of machinery and the inability of their own craft to institute a higher price for their work, which is for the most part based on the sliding scale plan. In the Cincinnati District the representative foundrymen have had informal meetings, and it is understood that the foundry men will endeavor to have their new contracts based on a trifle higher plane—an increase of something like 10 per cent. This they claim is necessary owing to the increased cost of coke, labor and materials entering into the manufacture of castings. A number of large contracts are expiring with the close of the year. It is scarcely probable, however, that any change will be made in the basing-price; that is, except in isolated cases.

Cleveland Machinery Market.

CLEVELAND, OHIO, November 30, 1909.

The demand on some of the merchants for machine tools is not quite as brisk as it has been during the past few weeks. While a fair volume of small orders continues to come in, some of the dealers expect that December will be a rather quiet month, but look for a renewed activity after the first of the year. The volume of sales in this market during November was about the same as October. While there is considerable scattered buying, the bulk of the business continues to come from industries allied to the automobile trade. The automobile manufacturers are now placing orders for automobile parts for delivery the coming season and many of these orders are for much larger quantities than for the past year. During the past year plants making automobile parts were taxed to their utmost in filling orders, and extensions are now being made to many of these plants to make capacity for the increased demand. Not much business is coming now from the automobile builders themselves, but new companies are being organized every few days to enter this field, a large share of these new enterprises being in Detroit and vicinity. Among the inquiries of the week is one for about 100 tools for a proposed automobile plant in Ohio. It may be decided, however, to make this largely an assembling proposition, and in that case the machine tool requirements will be greatly reduced. The heaviest demand at present is for lathes, although there is a fair demand for milling machines. There is a steady demand for automatic machines and some of the manufacturers are unable to promise deliveries within six months or longer. The demand for forging hammers and presses continues good.

In heavy hoisting machinery there is a fair volume of inquiries, but prospective purchasers are slow in placing orders. The demand for electric cranes, locomotive cranes and trolleys is very good.

In the foundry trade the demand for light castings continues heavy. Local foundries have about all the work they can do and some are compelled to turn away orders.

The Walworth Run Foundry Company, Cleveland, Ohio, will enlarge its plant by the erection of a new molding room, 140 x 250 ft. A new cupola will be installed, for which the company is in the market. A blower, molding machines and

other foundry equipment will also be purchased. The addition, which is expected to be completed in March, will increase the company's foundry capacity 75 per cent. and provide room for 80 additional molders. The company is so crowded with work that it has been compelled to turn away some orders.

The Electric Welding Products Company, Cleveland, which has just completed a large addition to its plant, will at once begin the erection of another addition. The building will be of brick, three stories and 94 x 100 ft. It will be used largely for increasing the capacity of the plant for making automobile and machinery parts. The machine shop will be enlarged considerably and the company will buy new equipment for this, including machine tools and special machinery, mostly the latter. In the new addition just completed the company has added six new furnaces, giving it an annealing room with 10 furnaces. With the completion of the second addition the capacity of the plant will be doubled. The extensions have been found necessary because of the growth of the company's business. The company now has all the work that it can do and is running its plant overtime.

H. L. Aiken, formerly connected with the Seaboard Steel Company of Chester, Pa., will start a crucible steel castings plant at 800 Canal road, Cleveland, under the name of the Crucible Steel Castings Company. Four furnaces and eight pots will be installed at the start, and the plant will be enlarged as the business demands. The necessary foundry equipment will be purchased soon.

Herbert B. Gillette, vice-president of the Gillette Roller Bearing Company, Grand Rapids, Mich., and R. G. Peters of Manistee, Mich., have erected a building in Grand Rapids, Mich., for the manufacture of a new conical roller bearing and expect soon to put up another building, two stories, 48 x 225 ft. For equipping their plant they are in the market for turret and automatic machines with a spindle capacity of 2 in. up to 6 in.

The Acme Machinery Company, Cleveland, maker of bolt and nut machinery, reports the continuance of a good volume of orders. The company's plant is now well filled up with work for the next three or four months.

The Rubber City Machine Company, Akron, Ohio, has been incorporated, with a capitalization of \$10,000, by G. A. Bloodgood, H. M. Braden, J. N. Romweber, J. T. Swartz and A. C. Dick.

The Brown Hoisting Machinery Company, Cleveland, reports a large volume of orders for locomotive cranes, electric cranes and trolleys, the demand being largely from steel plants and coal companies. In heavy handling machinery inquiries are more plentiful and the outlook for some good orders is encouraging.

The Pittsburgh Valve & Fitting Company, Barberton, Ohio, has commenced the erection of a large addition to its plant to increase the capacity of its malleable iron department.

Milwaukee Machinery Market.

MILWAUKEE, WIS., November 30, 1909.

There has not been a time within the memory of the oldest inhabitant when shop forces here increased with such rapidity as at present, all recent predictions having been considerably exceeded within the past two or three weeks. The largest local machinery builder, the Allis-Chalmers Company, states that there are now 6900 men employed at the Reliance and West Allis works, and that fully 500 will be added by January 1. The difficulty experienced in getting machinists and other skilled operatives seems to be diminishing in this immediate locality. At least there is less complaint. Out in the State, the demand for men continues to be considerably greater than the supply. Everywhere a great deal of overtime work is necessary, and the night shifts are gradually being extended.

Now, however, that the volume of business transacted has reached proportions which are generally satisfactory, the continued irregularity of prices is giving machinery builders in some lines considerable concern, as it renders it difficult for them to take orders on an acceptable basis. It is apparent that the adverse effect of price cutting, such as was freely indulged in a few months ago, will be felt in many quarters for some time to come. More than one shop in this State that has been rushed with work of late is operating almost at a loss because of the fact that it is filled up with contracts taken at unduly low figures. The advance in materials, with delayed purchasing, has accentuated this situation.

As a whole, though, values are gradually attaining to a higher level, and, with better shop economy as compared to the practice of two seasons ago, the coming calendar year gives promise of being an exceptionally profitable one. There is nothing more significant than the present tendency in metal working industries toward more effective utilization of existing facilities, and a trip recently made by the writer through another important manufacturing section, where several representative plants were visited, leads to the belief that Wis-

consin machinery builders are well in the van of the movement. The prevailing tendency finds expression not only in better methods of shop management and more economical handling of material during its progress from the raw to the finished product, but also in such improvement of machine tools and other apparatus already in operation as to render many of the older types practically equal to later designs. For example, a firm here that bought two large new combination tools to displace three smaller ones, because it had been demonstrated that these could do the same work in about 20 per cent. less time, was forced by a rush of orders to keep the old machines in service also. Since that time a study of the differences between the two types of construction has resulted in some relatively simple alterations, that make the old tools very nearly as efficient, for their capacity, as the new.

Extensions to plants are being planned in considerable number. Among the more important announcements made here during the past week is that the Malleable & Grey Iron Company, Layton Park, a suburb of Milwaukee, will erect a new steel frame brick building adjoining its present plant, with corresponding increase of equipment.

Manitowoc, Wis., is to have another aluminum plant, the Manitowoc Aluminum Company having been organized by J. C. Watts and Geo. Born, said to have been formerly identified with the works that were absorbed by the Aluminum Company of America. Enlargement of the latter establishment and installation of some new machinery is also reported to be in contemplation.

A central power and steam heating plant will probably be erected in connection with the new buildings at Reedsburg, Wis., decided upon for Sauk County. Inquiries should be addressed to the County Board.

The hydro-electric development of the Prescott Light & Power Company, Prescott, Wis., is reported here to have been so far retarded by the washing out of a dam under construction that it will be some time before machinery for the plant is needed. Authentic details are, however, lacking.

A banquet in promotion of the cause of industrial education, to which all prominent members of the metal working industries were invited, was held here this week under the auspices of the Citizens' Business League.

The C. H. Besley Tool Company, Beloit, Wis., whose contemplated extension was recently mentioned in this report, is planning to complete the addition by early spring. Only light tools will be needed.

A pumping station, equipped with direct acting steam pump of a centrifugal unit, and complete system of water works, have been decided upon by the authorities at Barron, Wis. Plans, however, have not yet been prepared.

The Wisconsin Bridge & Iron Company has contract for the structural work on a four-story factory for the Milwaukee Vinegar Company, erection of which will begin at once. Boilers and a small electric generating unit are reported as among the requirements of the plant.

Electric generating plants driven by wind power, similar to those which have been successfully operated in Denmark and other European countries, will be manufactured by a company which R. T. and F. A. Lange of Eau Claire, Wis., recently organized.

Work will be started about March 1 on two new buildings for the Simmons Mfg. Company's works at Kenosha, Wis. Electric motors will be used wherever power needs to be applied.

The plant of C. D. Pelletier & Co., Superior, Wis., will be remodeled and improved in equipment.

The A. O. Smith Company, whose purchase of additional land for a factory site was recently reported, is rushing to completion the buildings already decided upon. A large gas engine driven dynamo will furnish power for operating the entire plant electrically. The part now under construction will accommodate nearly 1500 men.

The Manitowoc Boiler Works Company has constructed the rotary kiln for a cement plant which has a length of 130 ft. and diameter of 9 ft., thereby equaling the record of some of the largest builders of this class of machinery, two of the principal of which are located in Milwaukee.

The Lyons Boiler Works, De Pere, Wis., which has taken some of the most important contracts let in this State during the past year, will extend its factory 110 ft. and build a new shop, 150 x 300 ft. For details of the new equipment which will be required later address the firm direct.

A machine and forge shop will be built in Milwaukee by the Jos. Obenberger & Sons Company.

A municipal power plant for lighting purposes, to be operated in connection with the water works, is under consideration at Baraboo, Wis.

A large quantity of substation machinery, including rotary converters, transformers, switchboards, &c., will be required by the Northern Hydro-Electric Company, Green Bay, Wis., as soon as its power plant at High Falls, on the Peshtigo River, has been completed. It is proposed to run transmission lines to Oshkosh, Two Rivers, Manitowoc and other towns in the great industrial district east of the Fox River. Electric power at low rates is certain to create a large demand for motors throughout that territory.

Government Purchases.

WASHINGTON, D. C., November 30, 1909.

The following bids were opened November 15 for operating machinery for dam No. 37, Ohio River:

Two straight line air compressors—Bidder 1, G. & W. Mfg. Company, New York, \$1800; 2, New Jersey Foundry & Machine Company, New York, \$2317; 3, W. Bateson & Co., Wheeling, W. Va., \$2065.

One turbo generator—Bidder 1, G. & W. Mfg. Company, New York, \$1690; 2, New Jersey Foundry & Machine Company, New York, \$1783; 3, W. Bateson & Co., Wheeling, W. Va., \$1707.

Four air receivers—Bidder 1, G. & W. Mfg. Company, New York, \$240; 2, New Jersey Foundry & Machine Company, New York, \$302.50; 3, W. Bateson & Co., Wheeling, W. Va., \$277.50.

Two water tube boilers—Bidder 1, G. & W. Mfg. Company, New York, \$2600; 2, New Jersey Foundry & Machine Company, New York, \$2700; 3, W. Bateson & Co., Wheeling, W. Va., \$2584.

One feed water heater—Bidder 1, G. & W. Mfg. Company, New York, \$300; 2, New Jersey Foundry & Machine Company, New York, \$412.50; 3, W. Bateson & Co., Wheeling, W. Va., \$404.

One feed water pump—Bidder 1, G. & W. Mfg. Company, New York, \$175; 2, New Jersey Foundry & Machine Company, New York, \$183.50; 3, W. Bateson & Co., Wheeling, W. Va., \$157.

Two duplex winding engines—Bidder 1, G. & W. Mfg. Company, New York, \$800; 2, New Jersey Foundry & Machine Company, New York, \$1105; 3, W. Bateson & Co., Wheeling, W. Va., \$980.

The following bids were opened November 23 for machinery for the navy yards:

Class 51.—Two turbo generating sets, one motor generating set and one switchboard with spare parts—Bidder 68, General Electric Company, Schenectady, N. Y., \$10,865; 157, Terry Steam Turbine Company, New York, \$10,795.

The following bids were opened November 20 for one 75-kw. engine driven generating set for the Naval Medical School Hospital at Washington, D. C.:

Item 1.—Generating set and accessories complete—Ames Iron Works, Baltimore, Md., \$3195, \$3107, \$3159, \$3449 and \$3867; G. & W. Mfg. Company, New York, \$3397 and \$3797; Ball Engine Company, Philadelphia, Pa., \$4738.

Item 3.—Price on bidders' specifications—McCay Engineering Company, Baltimore, Md., \$3150; Harrisburg Foundry & Machine Works, Harrisburg, Pa., \$3868 and \$3368; John D. Adt, Baltimore, Md., \$4011.

Bids were opened November 17 for one steam hammer for the blacksmith shop at the general lighthouse depot, at Tompkinsville, N. Y., as follows:

Griscom-Spencer Company, New York, \$812.13, accepted; Niles-Bement-Pond Company, New York, \$707 and \$770; Fairbanks Company, New York, \$823; McDougall & Potter Company, New York, \$825; Manning, Maxwell & Moore, New York, \$880 and \$1065.

The British Iron Trade Waiting.

November has brought no new developments in the British iron trade. Pig iron buyers still maintain a waiting attitude, and in no aspect is the situation particularly encouraging. Disappointment at the failure of American consumers to buy Cleveland District pig iron is intensified by the stagnation in home demand. One or two orders for hematite iron received from the United States have stimulated hope in that direction; but for the most part the exports to the United States are ferromanganese and spiegeleisen, with an occasional shipment of steel crop ends or other melting scrap. The stocks of pig iron in Connal's stores at Middlesbrough were 349,537 tons on November 18, an increase of about 252,000 tons in 12 months. The price of Durham coke tends upward, and a few cargoes of German coke were recently taken by ironmasters in the Cleveland District. The Spanish mine owners have not yet fixed their prices for 1910, but Rubio ore for this year's delivery is sold at 17 shillings 6 pence per ton, c.i.f. Middlesbrough.

The steel rail trade is only moderately active. Heavy sections are generally quoted £5 5s. per ton. In none of the finished lines are the mills fully employed owing to slackness in a number of engineering branches. The demand for railroad supplies and structural steel work in general has declined. Conditions in the sheet and tin plate trades are generally satisfactory, perhaps more so in the latter than in the former. Sheffield reports a good trade in tool steel with the United States. Hopes entertained for 1910 are the principal sustaining influence in nearly all branches of the trade.

The Carnegie Steel Company now has only one idle furnace, the stack at Steubenville, Ohio, which is being made ready for blast and will blow in about December 10.

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